A SYSTEMATIC STUDY OF THE GENUS *LASIACIS* (GRAMINEAE: PANICEAE)[1, 2, 3]

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ABSTRACT

A systematic treatment of the tropical American grass genus *Lasiacis* is presented. The gross morphology of *Lasiacis* is discussed. *Lasiacis* is panicoid in the form of its leaves, its roots, and its seedlings. Leaf anatomy was studied from cross-sections of blades and from the epidermis. *Lasiacis* has a typically non-Kranz (C_3) panicoid anatomy. It possesses the following major anatomical characteristics: three types of vascular bundles, angular secondary vascular bundles, partially radiate chlorenchyma around the vascular bundles, differentiated palisade and spongy chlorenchyma, double bundle sheaths around the primary vascular bundles, single parenchyma sheaths around the primary vascular bundles, single parenchyma sheaths around the secondary vascular bundles, short cells of costal zones in long rows, dumbbell and nodular silica bodies, bicellular microhairs, and triangular to dome-shaped subsidiary cells. The breeding system is predominantly inbreeding with a smaller amount of outbreeding. All species tested are self-compatible. New chromosome counts of $n = 18$ and $2n = 36$ are reported for 101 collections representing 13 species and 8 varieties. Reported for the first time are: *L. anomala*, *L. divaricata* var. *divaricata*, *L. harrisii*, *L. linearis*, *L. oaxacensis* var. *oaxacensis* and var. *maxoni*, *L. procerrima*, *L. ruscifolia* var. *velutina*, *L. sloanei*, *L. sorghoidea* var. *sorghoidea* and var. *patentiflora*, and *L. standleyi*. Meiosis was completely regular. In the taxonomic treatment, 23 taxa are recognized including 16 species and 13 varieties. A key to the species is provided. Synonymy, descriptions, discussions, distribution, ecology, common names, economic uses, and herbarium specimens are given for each species.

Lasiacis is a small neotropical grass genus of 16 species distributed from the southern tip of Florida and central Mexico south through the West Indies, Central America, and in South America to southern Peru and northern Argentina. Many species are rather striking in appearance because of their large, erect, woody culms. However, an almost equal number of species have procumbent, creeping, herbaceous culms. As striking are the shiny, black mature spikelets.

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[1] Based on a Ph.D. dissertation submitted to the Graduate College of Iowa State University, Ames, Iowa.

[2] I sincerely thank Dr. Richard W. Pohl for his support, advice, and helpful criticism throughout this study and in matters nonbotanical. I also thank Drs. D. Isely, J. L. Laffoon, N. R. Lersten, and K. Sadanaga, for critically reviewing the original dissertation and assisting in other ways. Appreciation is extended to the following persons who have helped me in various ways: Dr. T. R. Soderstrom, Smithsonian Institution; Dr. A. Lourteig, Muséum National d'Histoire Naturelle; Dr. E. McWilliams, Univ. of Michigan; Mr. C. Quarín, Univ. Nacional del Nordeste, Corrientes; Dr. M. T. Stiever, Carnegie-Mellon Univ., Pittsburgh; Dr. E. C. Tenorio, Univ. Federal Rural de Pernambuco; Dr. P. Weatherwax, Indiana Univ.; Dr. S. J. Goodband, Univ. of the West Indies, Trinidad; Dr. Jiménez, Dominican Republic; Ing. C. Blanco, Venezuela; Dr. Z. Luces de Febres and Dr. J. A. Steyermark, Instituto Botánico, Caracas; Drs. V. M. Badillo and L. Fernández, Univ. Central de Venezuela, Maracay; Dr. G. S. Bunting, Jardin Botánico, Maracaibo; Dr. G. R. Proctor, Institute of Jamaica; Mr. E. Conroy, Florida Atlantic Univ.; Dr. W. T. Stearn and Dr. E. Launert, British Museum of Natural History, London. I thank the curators of the herbaria listed in METHODS AND MATERIALS for providing specimens. I thank my wife, Jeany Vander Neut Davidse, for her support and encouragement during this study.

[3] Portions of the fieldwork were supported by Organization for Tropical Studies Grant F-70-26, N.S.F. Grants for Improving Doctoral Dissertation Research in the Field Sciences, GB-40630, and INT 76-14750 to Davidse, and Grants GB-7307 and GB-7307X to Pohl.

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ANN. MISSOURI BOT. GARD. 65: 1133–1254. 1978.

0026-6493/1133-1254/$12.25/0

All species are of little or no economic importance.

Lasiacis was first delimited as a section of *Panicum* (Grisebach, 1864). Hitchcock subsequently elevated the section to a genus (Hitchcock & Chase, 1910). This was followed by a treatment of all species north of Colombia (Hitchcock, 1920). This revision has continued to form a solid basis for later work in *Lasiacis*. Since Hitchcock's 1920 revision, published later in very similar form in *North American Flora* (Hitchcock, 1931), most systematic work with *Lasiacis* has been limited to regional floristic treatments, new species descriptions, and species transfers. The most important of these contributions were made by Hitchcock (1930, 1936), Parodi (1943), Swallen (1934, 1936, 1943, 1955a, 1955b, 1957), and Davidse (1974, 1977). Davidse & Morton (1973) reported on fruit dispersal, presenting evidence that the black spikelets are an adaptation to bird dispersal.

Systems of grass classification at the tribe and subfamily level traditionally relied largely on gross morphological features of the spikelets and inflorescences during the early part of this century. In recent years classifications have in addition been built on anatomical, cytological, physiological, and a wider array of gross morphological characters. Significant in the use of such a wide array of characters in constructing a system of grass classification was the pioneer effort of Avdulov (1931). He used size and base number of chromosomes, leaf anatomy, size and position of first seedling leaves, type of starch grains, and the type of nucleoli in nondividing cells to propose a new system of classification. Important among the new systems of classification that have used these characters are those of Prat (1960), Parodi (1961), and Stebbins & Crampton (1961). Although differing in detail, these authors agreed in recognizing six subfamilies (Bambusoideae, Oryzoideae, Arundinoideae, Pooideae, Chloridoideae, and Panicoideae). These new systems are phylogenetic and undoubtedly reflect genetic relationships much better than previous systems. The broad outlines of this new system seems rather stable at the present time.

There are many genera for which the new characters are not or only partially known, and these genera are placed in tribes and subfamilies strictly on the basis of spikelet and inflorescence structure. *Lasiacis* is such a genus. *Lasiacis* also has never been monographed in its entirety, nor have any biosystematic studies ever been made. In the following pages a complete systematic study of the genus is presented. A paper on hybridization will be published separately.

METHODS AND MATERIALS

This paper is based on studies in the herbarium, field, greenhouse, and laboratory.

Since *Lasiacis* has been rather extensively collected, complete collections were borrowed only from the major herbaria marked by an asterisk in the following list. Collections in other herbaria were studied in situ or specialized collections were borrowed. The herbaria are cited according to Holmgren & Keuken (1974): A, AWH, C, DS, EAP, F*, GH*, GOET, IJ, ISC*, K, L, MEXU*, M, MO*, MY*, NY*, P, RB*, SCZ, TRIN, UC*, US*, VEN*, WIS. Voucher specimens mentioned in this paper are deposited as ISC, and partial sets are also

deposited at MO and US. The abbreviations preceding collection numbers stand for the following collectors: *D* = Davidse, *E* = Erickson, *P* = Pohl.

Greenhouse Studies

Initially some difficulty was experienced in growing the various species in the greenhouse, mainly because of overwatering. The following procedure, with several exceptions, gave quite satisfactory results. Caryopses were dehulled (fertile lemma and palea removed), placed on blotters in petri dishes maintained at about 30°C, and watered as needed with distilled water. Dehulling speeded germination 10- to 20-fold. After the first or second leaf developed, seedlings were transferred to small pots with an equal mixture of peat moss and soil. Moderate watering with fortnightly to monthly liquid fertilizer applications encouraged normal growth.

Growth of the creeping species and *L. procerrima* in the greenhouse was best in a cool (ca. 21°C), plastic-enclosed humidity chamber containing a peat moss-soil mixture which allowed the stems to root at the nodes as they advanced. Even with the erect species, leaf longevity was promoted by growing the plants in humidity chambers.

In the greenhouse, flowering took place mostly from October through January. Many of these comparatively large grasses seemed to require about a year of vegetative growth before flowering commenced. However, several plants of *L. anomala* flowered less than six months from the date of germination.

Anatomical Studies

Collections were made both in the greenhouse and in the field. Greenhouse material was used for most part for comparative studies of cross-sectional leaf anatomy since those plants were grown under uniform conditions. Field collections were used only in a few cases when no greenhouse plants of the species were available. In each case, the first fully expanded blades of vegetative culms were sampled. This tended to insure that leaves of comparable age were used. However, this was probably not always strictly true since some plants were slow growing and others fast growing, the leaf samples of the former, therefore, being older.

Cross-sections of leaves about 0.5–1.0 cm wide were cut about ⅓ the distance from the base of the leaf blade. These sections were fixed in FAA (Sass, 1958). Dehydration was with tertiary-butanol and embedding was in Tissuemat (62°C mp). Sections were cut at 10–15 μm with "diSPo" disposable knives. Much tearing of tissues was experienced, probably due to the silica bodies in the epidermis. Soaking the embedded material for 24 hours in a softening solution (Pohl, 1965) alleviated the problem somewhat. Sections were stained with safranin-fast green and mounted in Piccolyte.

Epidermal features were studied from paradermally cut sections processed in the same manner as cross-sections. In addition, some observations were made from leaves cleared according to the method of Shobe & Lersten (1967) and stained with chlorozal black E according to the schedule given by Lersten & Pohl (1969).

CYTOLOGICAL STUDIES

Both meiotic and mitotic chromosomes were studied. For meiotic material collected in the field, young inflorescences were fixed and stored in Newcomer's (1953) solution. Anthers were dissected from the spikelets and squashed in propiocarmine stain. Observations were made from fresh preparations and were documented either by drawings made with the aid of a Zeiss drawing apparatus or photomicrographs. Subsequently, voucher slides were made permanent with the liquid-CO_2 method of Bowen (1956). Young inflorescences collected in the greenhouse were fixed with aspiration in either 3 ethanol:1 glacial acetic acid, or 6 ethanol:3 chloroform:1 glacial acetic acid. Results were similar for both fixatives. The fixed inflorescences were stored in the freezer compartment of a refrigerator in the fixative or in 70% ethanol. Storage in alcohol under low temperatures was helpful in reducing substantially the number of microsporocytes which burst during squashing. Better preparations were obtained from greenhouse-fixed material than from field-fixed material.

Observations on mitotic chromosomes were made from root tips of germinated caryopses or potted plants In both cases, the number of dividing figures was low. Root tips were pretreated either in cold water at 2–4°C for 24 hours or with a saturated solution of 8-hydroxyquinoline for 4 hours at 14°C in order to arrest dividing cells at metaphase and to shorten and spread the chromosomes. Fixation was in 3 ethanol:1 glacial acetic acid. Root tips were stained with the Feulgen reagent and then squashed. Further procedure was identical to that used in the meiotic studies.

MORPHOLOGICAL MEASUREMENTS

All spikelet, ligule, and leaf measurements were made on dried herbarium specimens. Since leaf blades in *Lasiacis* vary from rudiments to fully developed on almost every branch, only the largest blades on each herbarium specimen were measured. The minimum values reported for blade length and width, therefore, do not represent the absolute minimum values, but only the minimum values for the largest leaves found on herbarium specimens. Ligule lengths were measured on the two leaves immediately below an inflorescence. Spikelets were measured in side view from the middle of the pedicel to the tip of the spikelet. Inflorescence length was measured from the lowest node even though that node often has only rudimentary branches.

GROSS MORPHOLOGY

ROOTS

The root system among *Lasiacis* species is quite uniform and, except for the mode of root initiation, does not provide many characters of systematic importance.

Hoshikawa (1968, 1969) has made an extensive survey of the morphology of grass seedlings, emphasizing the mode of root initiation and seedling establishment. Six morphological types were recognized which correlated well with

the six subfamilies commonly recognized in modern systems of grass classification.

The following species of *Lasiacis* were examined, after germination under conditions similar to those detailed by Hoshikawa (1969): *L. anomala*, *L. divaricata*, *L. ligulata*, *L. linearis*, *L. oaxacensis*, *L. procerrima*, *L. rhizophora*, *L. ruscifolia*, *L. scabrior*, and *L. sorghoidea*. The radicle emerges first and produces the primary root. This primary root soon branches to produce secondary rootlets. In the terminology of Hoshikawa (1969), the seedlings may be described as follows: No roots are formed from the basal portion of the primary root (–), i.e., no "transitionary node roots" are formed. The mesocotyl elongates readily (+), and at least a few mesocotylar roots are formed consistently (+) (Fig. 1). In Hoshikawa's (1969) notation, *Lasiacis* is typified by the seedling formula –, +,+, In this notation, (–) indicates the absence of that character and (+) its presence. This formula is identical to that for all genera of the Paniceae that have been examined.

Several other features of the roots of mature plants may be noted. All species produce adventitious roots, especially at the lower nodes. Those of the erect species, except for *L. procerrima*, are similar and inconspicuous. *Lasiacis procerrima* usually produces large, prominent, adventitious prop roots from the lower nodes. Often the entire plant may be supported above the soil surface by these prop roots, which always remain unbranched until they reach the soil surface. Similar, but less conspicuous, roots are produced by the creeping species.

Upon bending, lodging, or falling to the ground, all erect species can produce adventitious roots at the culm nodes. When this happens, vegetative reproduction sometimes takes place.

CULMS

The culms or stems of many *Lasiacis* species are remarkable for their large size and woody appearance, and I refer to species possessing these as erect, woody species (Fig. 2). Culms are generally 1–5 m long, but I have observed one plant to reach 10 m in length. The woodiness is not due to secondary growth but to a large amount of lignified primary tissue. A cross-section of the culm shows a series of 2–8 rings of separate vascular bundles embedded in a parenchymous ground tissue. Beneath the epidermis is a layer of sclerenchyma fibers. This fibrous layer is relatively well developed in the woody species. Along with the lignification of some parenchyma of the ground tissue in maturing culms, the fibrous layer beneath the epidermis and the sclerenchyma fibers associated with the vascular bundles give the culm its mechanical strength.

Although the culms of the woody species can be generally described as erect, they are in fact often climbing or scandent, usually arching and supported in part by the surrounding vegetation. In many cases, the culms cannot support themselves, and if the surrounding vegetation is removed, the culms bend down to the ground. The ability to grow erect into the surrounding vegetation depends on the growth and branching habits of the culms. Buds from the lower nodes of existing culms produce vigorous young shoots which quickly elongate

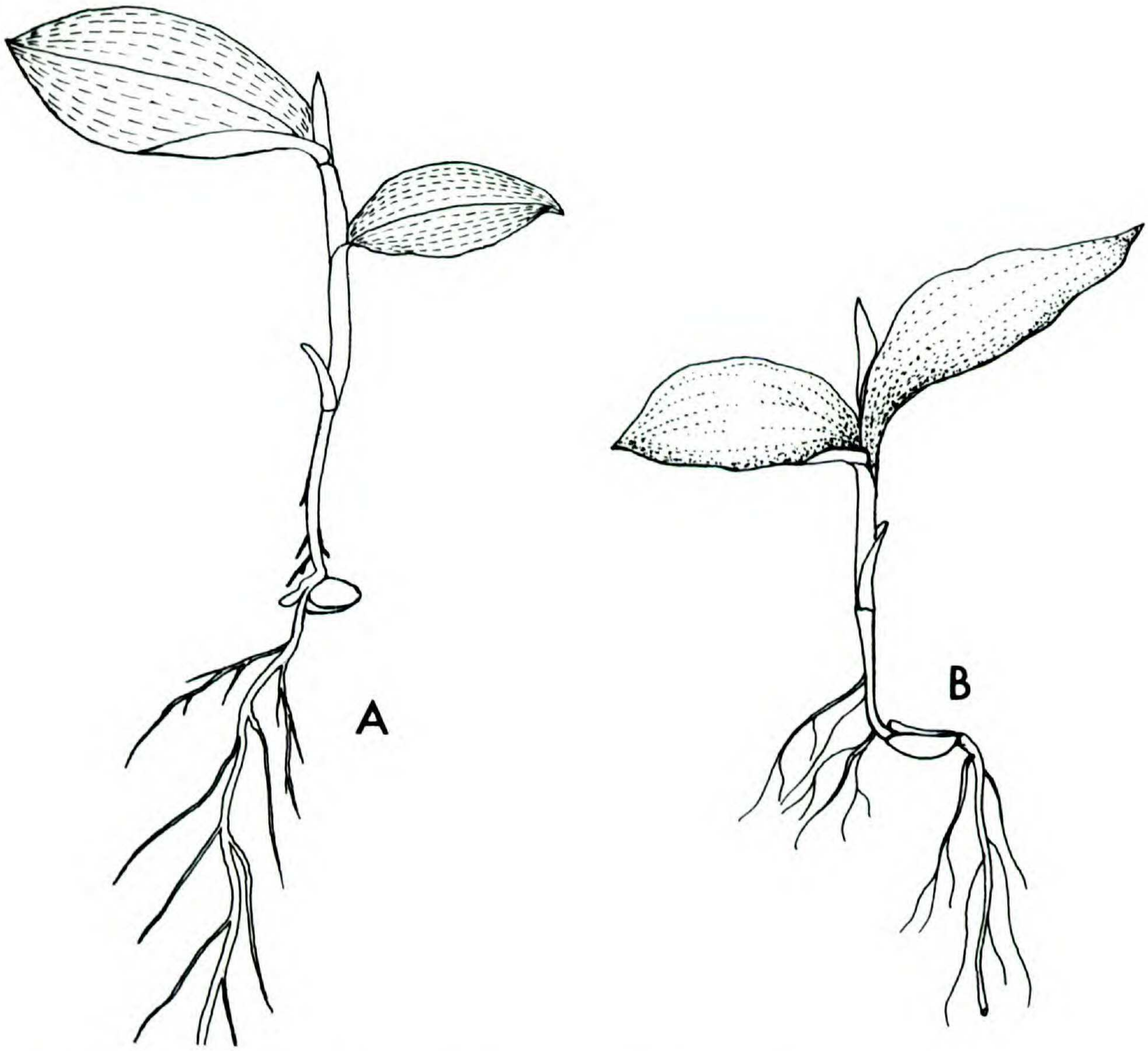


FIGURE 1. *Lasiacis* seedlings.—A. *L. nigra*.—B. *L. ruscifolia* var. *ruscifolia*.

without branching. When the new culm has reached its approximate maximum length, branching from the upper nodes is initiated. The initial growth in length can be supported in an erect or slightly arching position by the mechanical tissue of the culm. With increased branching, the weight of the culm becomes too great, and it will begin to bend down. However, since the initial growth of the main culm pushes it into surrounding vegetation, the culm can then be supported.

The creeping species have a culm anatomy similar to the erect species. The main difference is the smaller size and smaller amount of lignified tissue and the production of roots at nearly all nodes (Fig. 2).

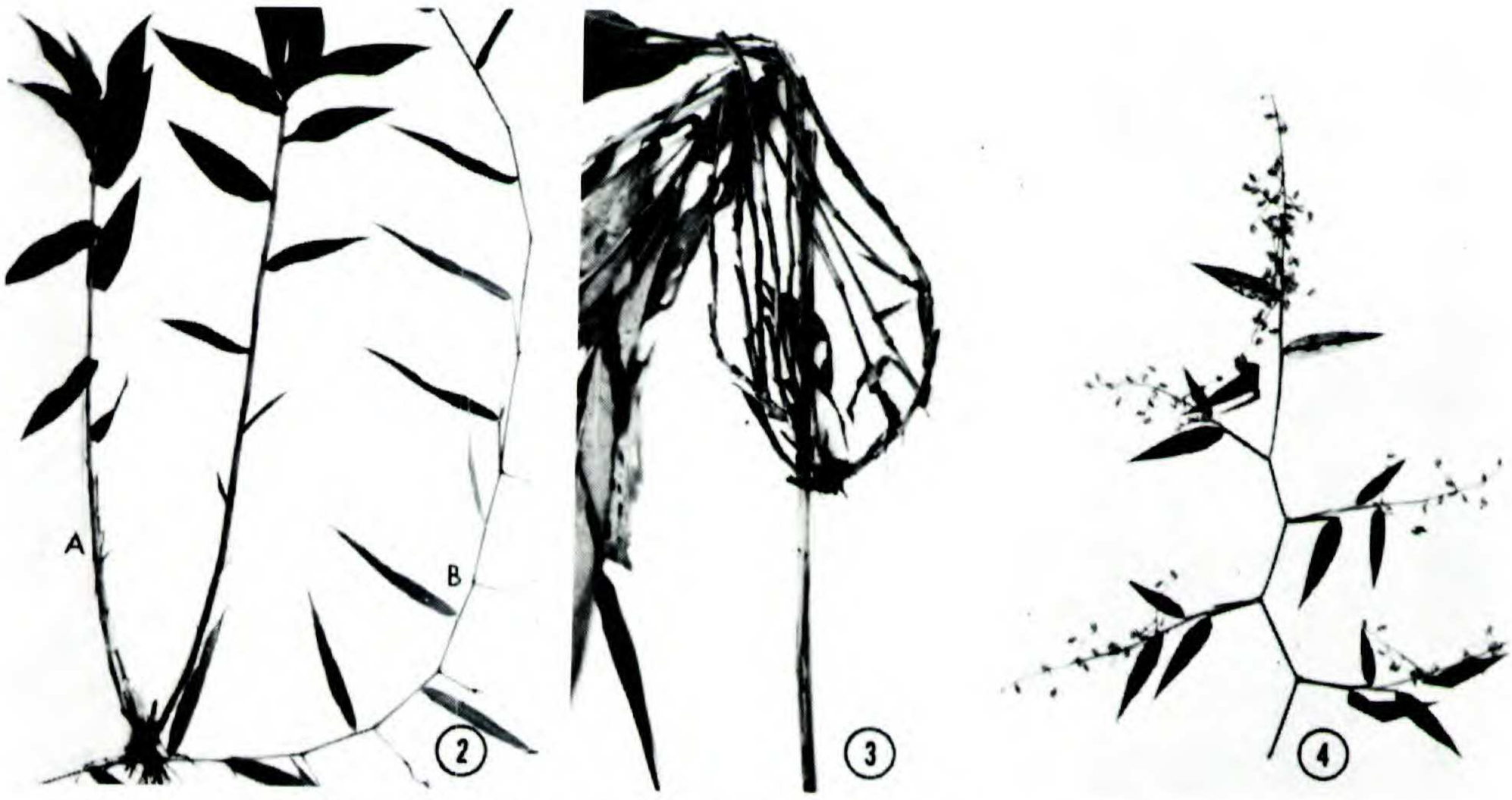
Culm Internodes.—Three of the creeping species, *L. linearis*, *L. oaxacensis*, and *L. rhizophora*, have solid, pithy internodes. Of the erect woody species, many specimens of *L. divaricata* var. *leptostachya* may have partially solid culms, and in *L. ruscifolia* var. *ruscifolia* there are a few local populations in Ecuador that have solid culms. The pith consists of thin-walled parenchyma cells, and it lacks vascular bundles, in contrast to the stems of most other monocotyledons and even some grasses such as *Zea mays*. The pith remains

almost indefinitely, although it may occasionally break down in old internodes of *L. linearis*. In the species with hollow internodes, the pith disappears early in the ontogeny of the culm. By the time a leaf has fully expanded, the pith remains only as an internal lining in the hollow internode above the base of the fully expanded leaf.

Although many standard reference works (e.g., Arber, 1934; Lawrence, 1951; Chase, 1959; Bor, 1960) state that grass internodes are usually hollow, Brown, Harris & Graham (1959) pointed out that this statement is misleading or incorrect when applied to the grass family as a whole. They demonstrated that 54% of a sample of 190 species had solid internodes. Solid internodes occur frequently in panicoid and chloridoid grasses but rarely in pooid grasses. In the tribe Paniceae, 49% of the species examined had solid internodes. In the light of these results, *Lasiacis* has an atypically low percentage of species with solid internodes.

Pulvini.—The ability of grass stems to straighten after becoming lodged is in a large part due to pulvini which can be recognized as swellings at the base of an internode. Differential growth in the pulvini results in the upward bending of culms. Pulvini, depending on their location, are called sheath pulvini or culm pulvini (Hackel, 1890; Arber, 1934; Brown, Pratt & Mobley, 1959). In all *Lasiacis* species, the culm pulvinus is prominent and strongly developed. A slight thickening at the base of the sheaths indicates that there is a poorly differentiated sheath pulvinus. This pulvinus is evident in very young leaves before a culm pulvinus is clearly differentiated. It is likely, therefore, that the sheath pulvinus is active in early growth, the function being carried on subsequently by the culm pulvinus in older parts of the culm. In the possession of culm pulvini, *Lasiacis* is typical of the Panicoideae. The Pooideae, in contrast, rarely have culm pulvini (Brown, Pratt & Mobley, 1959).

Branching patterns.—Most mature *Lasiacis* plants are highly branched. Branching in all species is intravaginal, the new branches emerging between the culm and the subtending sheath. Rare exceptions to intravaginal branching have been observed in *L. procerrima*. Branches develop from buds at the nodes. Those branches that develop from buds on the main culm I call primary branches. The next order of branching is referred to as secondary branching and so on. Only one primary branch forms at each node of the main culm. Subsequent modes of branching may result in quite different plant bodies. In one type of branching, the primary branch may produce a number of secondary branches. The next order of branching is referred to as secondary branching primary one in length. Since the lowest internodes of a branch are very short, this results in a fascicle of branches (Fig. 3). A second type may be called an open one since it characteristically produces well-spaced secondary and tertiary branches throughout the length of the primary branch (Fig. 4). The two types of branching grade into each other. Fascicled branching occurs most frequently at the upper nodes of large culms, while the open form is most characteristic of the lower nodes. In mature plants it is also common to see fascicles of secondary and tertiary branches at the upper nodes of a primary branch. Fascicled branch-



FIGURES 2–4. Gross morphology of *Lasiacis*.—2. Comparison of growth habit.—2A. *L. ruscifolia* var. *ruscifolia*, an erect woody species; note rudimentary blades at the lower nodes.—2B. *L. oaxacensis* var. *maxonii*, a creeping, herbaceous species, rooting at the nodes.—3. Fascicled branching in *L. sorghoidea* var. *sorghoidea*.—4. Open branching and zigzag culm in *L. rugelii* var. *rugelii*.

ing does not occur in the creeping species. These species always produce one branch per node, and the size distinction between the main culm and its branches is usually soon lost.

Branching pattern is of limited diagnostic value in *Lasiacis*. However, it characterizes *L. divaricata* var. *divaricata* and *L. rugelii* var. *rugelii*. In both varieties, the upper main culms become zigzag after branching (Fig. 4). The main culm is initially straight, but as the primary branch begins to grow, the main culm diverges in the opposite direction. Since leaf arrangement is alternate, the end result is a zigzag pattern. The divergence of the main culm seems to be caused by differential growth of the culm pulvini. The divergence of the primary branch is frequently so great that this branch becomes reflexed, thus forming a hooklike structure which is effective as a climbing device. It also aids in maintaining support for the main culm. A similar zigzag pattern may develop on vigorous primary branches when they produce secondary branches.

LEAVES

Avdulov (1931) pointed out the importance of the shape and position of the first seedling leaf in the systematics of the Gramineae. He recognized two types. The first, which corresponds to the pooid type, has a linear, perpendicular first leaf. The other, the panicoid type, has an oval, lanceolate, or oblong, horizontal, or ascending first leaf. Stebbins (1956) and Stebbins & Crampton (1961) subsequently stressed the importance of seedling leaves. Kuwabara (1960) made detailed observations on a number of species and found his observations, with several exceptions, to agree closely with those of Avdulov. The first leaves in seedlings of *Lasiacis* species are relatively broad, and their position

is horizontal to slightly ascending above the soil surface (Fig. 1). Of the species examined, *L. linearis* and *L. oaxacensis* have linear-lanceolate first leaves, thus reflecting the shape of the mature leaves. The remaining species, *L. anomala*, *L. divaricata*, *L. ligulata*, *L. rhizophora*, *L. ruscifolia*, *L. scabrior*, *L. sloanei*, and *L. sorghoidea*, have broadly elliptic or oval leaf blades. In seedling leaf morphology, *Lasiacis* is typically panicoid.

Lasiacis is similar to many other tall grasses such as *Olyra*, *Phragmites*, and bamboos in that the lowest leaves on new culms are nearly bladeless (Fig. 2). Higher up the culms, the blades become increasingly developed.

The prophyll has not been examined in detail. This prominently 2-keeled structure varies in pubescence. In some species, such as *L. divaricata* and *L. rugelii*, which often have widely diverging branches, the prophylls may be prominently displayed. In other species, they are often hidden within the sheath of the subtending leaf.

Sheath margins are free, and the upper or overlapping margin is usually ciliate. The apex of the sheath occasionally extends as a narrow auricle beyond the apex of the sheath. This is most highly developed in *L. procerrima*. The collar, the abaxial surface of the junction of the blade and the sheath, has been called a petiole (Nuñez, 1952; Hsu, 1965) when elongated somewhat. More properly called a pseudopetiole, it is most highly developed in *L. sloanei* and rarely exceeds 3 mm.

INFLORESCENCE AND SPIKELETS

The inflorescence of all species of *Lasiacis* is a panicle. It provides many important diagnostic characters including size, mode of branching, and arrangement of the spikelets.

The spikelets of all *Lasiacis* species except *L. anomala* are of the *Panicum* type. They consist of two glumes and two florets arranged alternately and distichously on the common axis, the rachilla. The lower or sterile floret consists of a lower or sterile lemma, a palea, and sometimes a staminate flower of three stamens and two lodicules. Sterile is not used in the absolute sense but in the sense of Hitchcock (1951), who defines sterile to mean without a pistil. In many species, the sterile floret does not contain a flower at all or contains only the rudiments of one. The upper or fertile floret consists of an upper or fertile lemma, a palea, and the included, perfect flower which is composed of two lodicules, three stamens, and a pistil with two free styles and stigmatic branches. At maturity, the fertile floret becomes indurate whereas the other bracts retain their soft texture. *Lasiacis* is unique in developing a shiny black color in the glumes and sterile lemmas after the caryopsis has fully matured. This seems to be an adaptation for bird dispersal (Davidse & Morton, 1973).

The spikelet of *L. anomala* is basically the same as the *Panicum* type but differs in bearing one additional bract, called a sterile lemma by Hitchcock (1919). Therefore, the spikelet of *L. anomala* bears two glumes, two sterile florets, and one fertile floret. The extra sterile lemma never encloses a palea, and for this reason, the extra bract could with equal justification be called an extra

glume. The presence of such an extra bract occurs only rarely in the Paniceae, another example being *Panicum quadriglume* (Doell) Hitchc. from South America.

DEVELOPMENTAL MORPHOLOGICAL VARIATION

A considerable amount of developmental morphological variability is exhibited by *Lasiacis* species. This variation is most conspicuous in the development of leaves, inflorescences, and pubescence. I have already noted that the culms in all species tend to be highly branched. With each successive order of branching, leaves become smaller, so that it is not unusual for fully expanded leaves on secondary branches to be one-third the size of those on the main culm. There is also often a reduction in the size of the inflorescences on secondary branches. There are two notable developmental variation patterns in pubescence. It is quite common for leaves of secondary and tertiary branches to be conspicuously more densely pubescent than primary leaves. This phenomenon is also common in new, young, vigorous main shoots in large plants. The increased pubescence is especially prominent in both cases on the lower leaves of the branch or shoot. On fully mature main culms, the younger leaves may often become glabrate in comparison to the lower ones.

Recognition of such developmental variation becomes quite important in such large plants as those of *Lasiacis* since specimens are often fragmentary. Care must, therefore, be exercised in relating variation observed among specimens to the causative agent which may be developmental, environmental, or genetic.

DURATION

All species of *Lasiacis* are perennial, or at least potentially so. According to Hitchcock (1920), *L. procerrima* is annual. This may be true in certain habitats, especially disturbed, bare roadsides or similar extreme ecological niches in which *L. procerrima* often becomes very depauperate. In regions with a definite dry season, such plants probably rarely survive more than one growing season. In more stable secondary communities with more favorable moisture conditions, I have observed large, branched plants in which the terminal portions of the culm bore old inflorescences. The lower parts of the main culms were still producing new branches with new inflorescences. This indicates survival through at least two growing seasons. In the greenhouse, *L. procerrima* also acts as a perennial.

There is also a question whether the individual culms of the erect, woody species are perennial. Dr. Paul Weatherwax (pers. comm.) has indicated that he believes *Lasiacis* to be a herbaceous perennial since the aerial parts die down to the ground after flowering, new shoots coming up later from the underground parts. This is invariably true of the small "seedling" culms that produce inflorescences. After larger culms have been formed, the strictly vegetative "seedling" culms often undergo the same fate. However, in well-developed culms, several courses may be followed. If primary branches have been formed and the main

culm produces a terminal inflorescence, the primary branches may remain vegetative and flower the next year. Such a culm is perennial. If both the main culm and the primary branches produce inflorescences, the culm does not necessarily die, but it may produce new branches, usually in fascicles which later can produce new inflorescences. Such fascicled culms, even in their natural habitat, no doubt take two years to grow to maturity.

Leaf Anatomy

The importance of leaf anatomy in providing characters for use in classification was already recognized in the 19th century by Duval-Jouve (1875) on the basis of his studies of several different cell types in various grass species. Avdulov (1931) recognized two major groups on the basis of leaf anatomy. These two groups corresponded to his two major subdivisions of the Gramineae, the Poatae and the Sacchariferae. In modern terminology, these groups are referred to as pooid and panicoid, respectively. Prat (1932, 1936) in two classic papers pointed out the importance of the epidermis as a source of taxonomic characters. He used these, plus other characters, to propose three subfamilies: Festucoideae, Bambusoideae, and Panicoideae (Prat, 1936). Numerous recent contributions have shown the usefulness of leaf anatomy in grass systematics. Several of general interest and importance may be noted. Brown (1958), placing emphasis on the presence or absence of bundle sheaths and the arrangement of the chlorenchyma, recognized six anatomical groups. Five of these correspond closely with the subfamilies now generally recognized. Metcalfe's (1960) monumental work brought together original and published diagnostic specific and generic descriptions based on characters of the epidermis and transverse section of the blade. In his discussion, three major anatomical groups were recognized, corresponding to the pooid, panicoid, and bambusoid grasses. Several subgroups of the panicoid type were also described. Tateoka et al. (1959) surveyed 238 species of grasses and found that, with few exceptions, the Eragrostoideae, Panicoideae, and Bambusoideae have distinctive types of bicellular hairs.

In recent years many of the anatomical characters which have proven useful in the classification of grasses have been linked to physiological characters associated with two systems of photosynthesis, the C_3 and C_4 systems (Hatch & Slack, 1970; Carolin & Jacobs, 1973; Johnson & Brown, 1973; Smith & Brown, 1973; Laetsch, 1974; Brown, 1975). Plants with C_4 photosynthesis fix carbon initially into 4-carbon compounds and those with C_3 photosynthesis into 3-carbon compounds. Other physiological and biochemical characters associated with C_4 plants, as compared to C_3 plants, are low CO_2 compensation points, high rates of net photosynthesis, higher optimum temperatures for photosynthesis, reduced photorespiration, and greater compartmentalization of biochemical reactions. C_4 plants have a distinctive anatomy, called a Kranz anatomy, characterized by a prominent parenchyma bundle sheath around each vascular bundle. The cells of this bundle sheath are large, thick-walled, possess specialized chloroplasts, store starch, and have a dense cytoplasm. The mesophyll tends to be highly radial around the vascular bundles and does not accumulate starch. In C_3 plants with a non-Kranz anatomy the cells of the parenchyma bundle sheath have few

or no unspecialized chloroplast, do not accumulate starch, and usually have large vacuoles and little cytoplasm. The mesophyll is not strictly radially arranged and stores starch. One of the important consequences of these correlations is that it is now possible to hypothesize in functional terms about the possible adaptive nature of these sets of characters, although it is often difficult to place these hypotheses in a phylogenetic context for specific genera and species.

Except for a brief characterization of the parenchyma sheath of *L. procerrima* by Carolin & Jacobs (1973), no studies of leaf anatomy have been reported for *Lasiacis*. However, without providing any published data, Nuñez (1952) stated that: "La estructura histofoliar [of *Lasiacis*] revela semejanzas con la de géneros pertenecientes a la subfamilia *Bambusoideae* Roshevitz." Hsu (1965) conducted an extensive survey of *Panicum* species and representative species of other genera of the Paniceae using characters of the lodicules, style bases, and epidermal patterns of the lemmas. In his discussion of *Lasiacis*, Hsu (1965) stated that: "The anatomical leaf structure of this genus is similar to bamboos." Again no data or illustrations were provided.

Since both Nuñez (1952) and Hsu (1965) suggested that leaf anatomy might be of the bambusoid type or closely related to it, I have investigated leaf anatomy as seen in cross-sections of the blades and surveyed the blade epidermis in seven representative species. The terminology employed throughout the discussion of leaf anatomy follows that of Metcalfe (1960).

LEAF BLADE IN CROSS-SECTION

General Characteristics.—Unless otherwise stated, the general description that follows applies to all species examined. A complete list of the vouchers for the species examined anatomically is given in Table 1.

All species contain three clearly differentiated types of vascular bundles (Fig. 5). The first of these, the main vascular bundle (MVB), is the largest vascular bundle in the leaf and is contained in the midrib of the blade (Figs. 10, 12). The clearly differentiated xylem and phloem of the MVB is surrounded by an inner bundle sheath (IS) of sclerenchyma fibers. It is also surrounded by a single- or multi-layered parenchyma bundle sheath or outer bundle sheath (OS). Inside the adaxial and abaxial epidermis and above and below the MVB are two girders of sclerenchyma fibers. The OS may be interrupted adaxially and/or abaxially by an extension of sclerenchyma which connects the sclerenchyma of the IS with that of the sclerenchyma girders. The combined cross-sectional appearance of the sclerenchyma girders of the MVB is always anchor-shaped, i.e., the adaxial girder is narrow and the abaxial girder is very broad (Fig. 5). The vascular bundles of the lamina of the blade may be distinguished as primary vascular bundles (PVBs) and secondary vascular bundles (SVBs). The PVBs are separated from each other by 3–7 SVBs (Fig. 5). The PVBs are large and the xylem and phloem is clearly differentiated (Figs. 6, 8). In addition, the PVB has one prominent metaxylem vessel element to each side of the protoxylem, has a well-developed IS and OS, and is accompanied by abaxial and adaxial sclerenchyma girders. The SVBs are small, angled, and the xylem and

TABLE 1. Voucher specimens examined for leaf anatomy. The plants were grown from seed collected in the indicated localities.

L. anomala

TRINIDAD: Between Piarco and Piarco Int. Airport, *D 2522*,[a] *D 2523*; Irois Bay, *D 2580*;[a] 2 mi post, Mausiga Rd., NE of Piarco, *D 2591*.[a]

L. divaricata var. *divaricata*

UNITED STATES: Florida: Monroe Co., 10 mi NE of Flamingo, *Deam s.n.* HONDURAS: Atlantida: 17 km SSE of La Ceiba, *DP 2196*. Comayagua: San José de Comayagua, *DP 2226*. NICARAGUA: Zelaya: Río Coco at Bilwaskarma, *DP 2295*. DOMINICAN REPUBLIC: La Vega: 18 km N of Jarabacoa, *D 2633*.

L. ligulata

TRINIDAD: 6 mi N of Port-of-Spain along North Coast Rd., *D 2561*; Between La Vache and Maracas Bay, *D 2566*.

L. linearis

HONDURAS: Morazán: Mt. Uyuca, *DP 2100*.

L. nigra

HONDURAS: El Paraíso: 7 km NW of San Lucas, *PD 12161*.

L. oaxacensis var. *oaxacensis*

EL SALVADOR: Libertad: Volcán de San Salvador, *DP 2026*. MEXICO: Tabasco: 9 mi NW of Santiago Tuxtla, *PD 11818*.

L. oaxacensis var. *maxonii*

HONDURAS: Yoro: 15 km SSE of Río Viejo, Rd. to Olanchito, *DP 2199*.

L. procerrima

HONDURAS: Morazán: 8 km E of El Zamorano, *DP 2081*. COLOMBIA: Caquetá: Florencia, *Soderstrom s.n.*

L. rhizophora

HONDURAS: Morazán: Mt. Uyuca, *P 12489*. COSTA RICA: San José: S of Curridabat, *PD 11694*.

L. ruscifolia var. *ruscifolia*

MEXICO: San Luis Potosí: Near Xolol, *PD 11808*. EL SALVADOR: Libertad: 1.5 km E of Apulo, Lago Ilopango, *DP 2033*. HONDURAS: Cortes: 1 km S of Puerto Cortes, *DP 2169*. Atlantida: 9 km E of Tela, *DP 2188*; 17 km SSE of La Ceiba, *DP 2198*. COSTA RICA: Guanacaste: Vicinity of Cañas, *Daubenmire 169*; Puerto Castillo, *PD 11562*.

L. ruscifolia var. *velutina*

HONDURAS: Morazán: Between El Zamorano and San Antonio de Oriente, *DP 2162*, *P 12508*.[a]

L. scabrior

HONDURAS: Atlantida: 28 km NE of El Progreso, *DP 2173*.

L. sloanei

HONDURAS: Yoro: 19 km SE of Río Viejo, *DP 2200*. COSTA RICA: Limón: Near Pandora, *PD 11123*.

L. sorghoidea var. *sorghoidea*

COSTA RICA: Puntarenas: Near San Vito de Java, *PD 10790*. TRINIDAD: Northern Range, near Heights of Guanapo, *D 2460*.

[a] Both field collections and greenhouse plants examined.

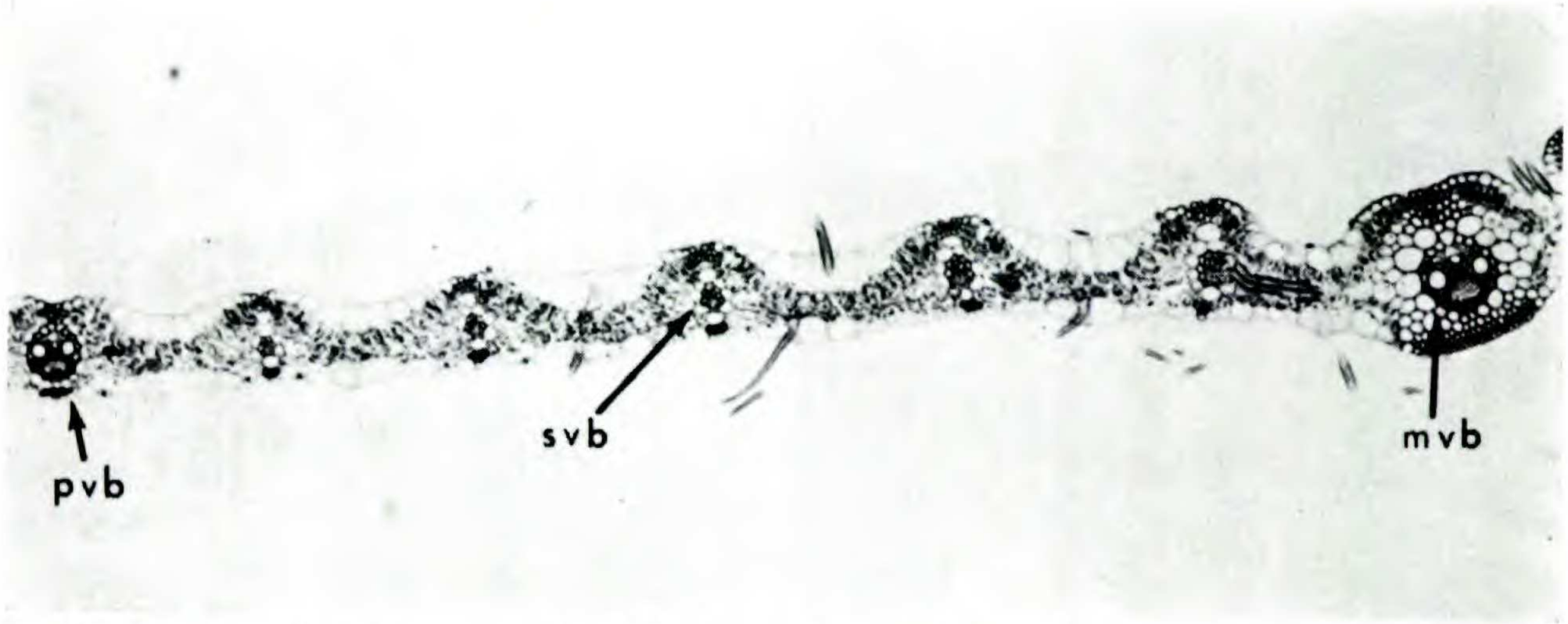


FIGURE 5. Cross-section of leaf blade of *Lasiacis ruscifolia* var. *ruscifolia*; note the main (mvb), primary (pvb), and secondary (svb) vascular bundles.

phloem are not as clearly differentiated as in the PVBs, although these tissues are usually recognizable (Figs. 7, 9, 14). The SVBs also lack the IS and prominent metaxylem elements. The OS is, however, usually more prominent than in the PVBs. Small adaxial and abaxial girders usually accompany the SVBs.

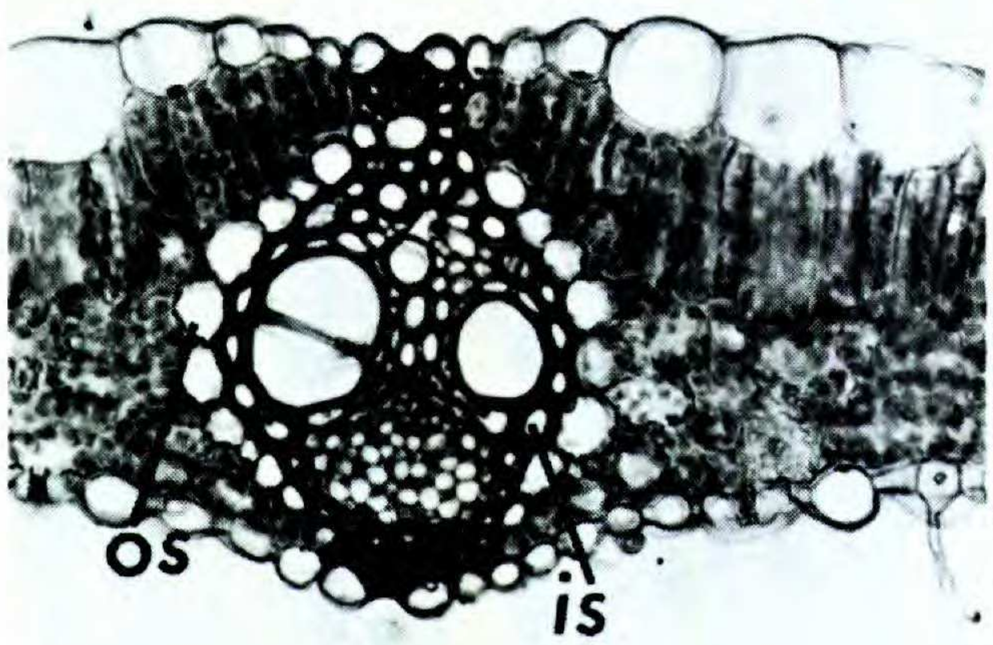
The arrangement of the chlorenchyma is very characteristic and similar in all species. Palisade and spongy layers are differentiated (Figs. 6–7). The palisade layer is made up of a single layer of elongated chlorenchyma cells. The spongy tissue is made up of cells that are usually irregularly spherical or somewhat elongated. A single layer of elongated chlorenchyma cells is arranged radially around the PVBs and SVBs (Figs. 9–14).

Bulliform cells occur in the adaxial epidermis; they are sometimes quite large, well differentiated, and arranged in regular groups (*Zea* type; Metcalfe, 1960; Figs. 11, 13). In most species, the cells are not as large and conspicuous as in the *Zea* type. Ribs and grooves are inconspicuous in all species, although they are present to a slight extent next to the midrib, especially on the adaxial surface.

Starch is absent in the outer parenchyma sheath of all species but accumulates in the chlorenchyma of the palisade and spongy layers.

Characteristics of Individual Species.—Characteristics of the cross-sectional leaf anatomy for each species are presented in Tables 2 and 3. For consistency, all observations were made on the set of PVBs and SVBs immediately adjacent to each side of the MVB. Some changes in the configuration of the tissues and size of cells takes place toward the margin of the blade: bulliform cells usually become smaller and less conspicuous, the PVBs become smaller, and adaxial extensions of the OS of the SVBs become smaller or disappear.

Leaf blades of most *Lasiacis* species are similar anatomically. *Lasiacis procerrima*, in parallel with its gross morphological distinctiveness, is anatomically very distinct. It has thick leaves, well-developed bulliform cells, multilayered bundle sheaths, large sclerenchyma girders, and MVBs with two closely associated SVBs (Fig. 10). *Lasiacis oaxacensis* is most similar anatomically to *L. procerrima* (Fig. 12). It also has two SVBs closely associated with the MVB.



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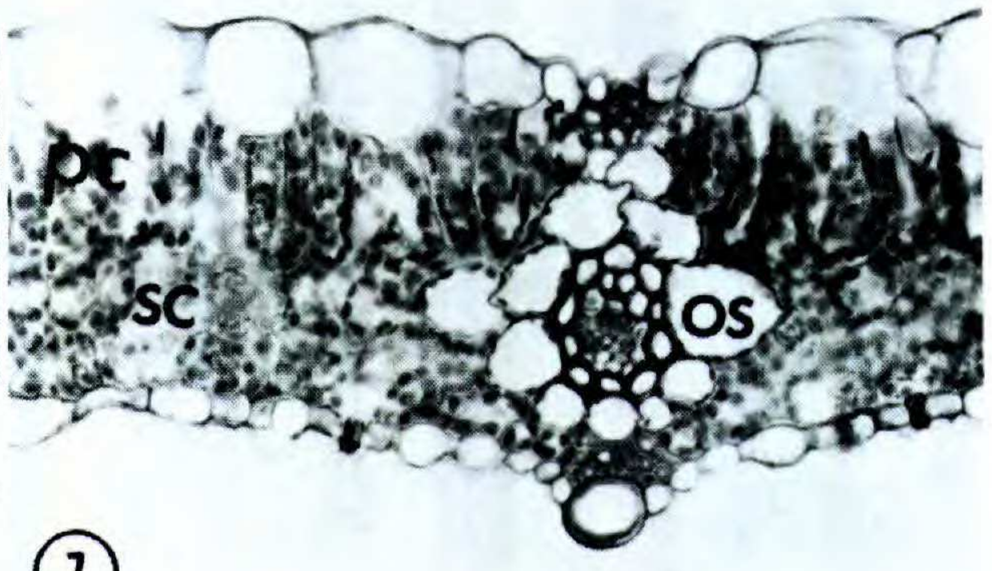

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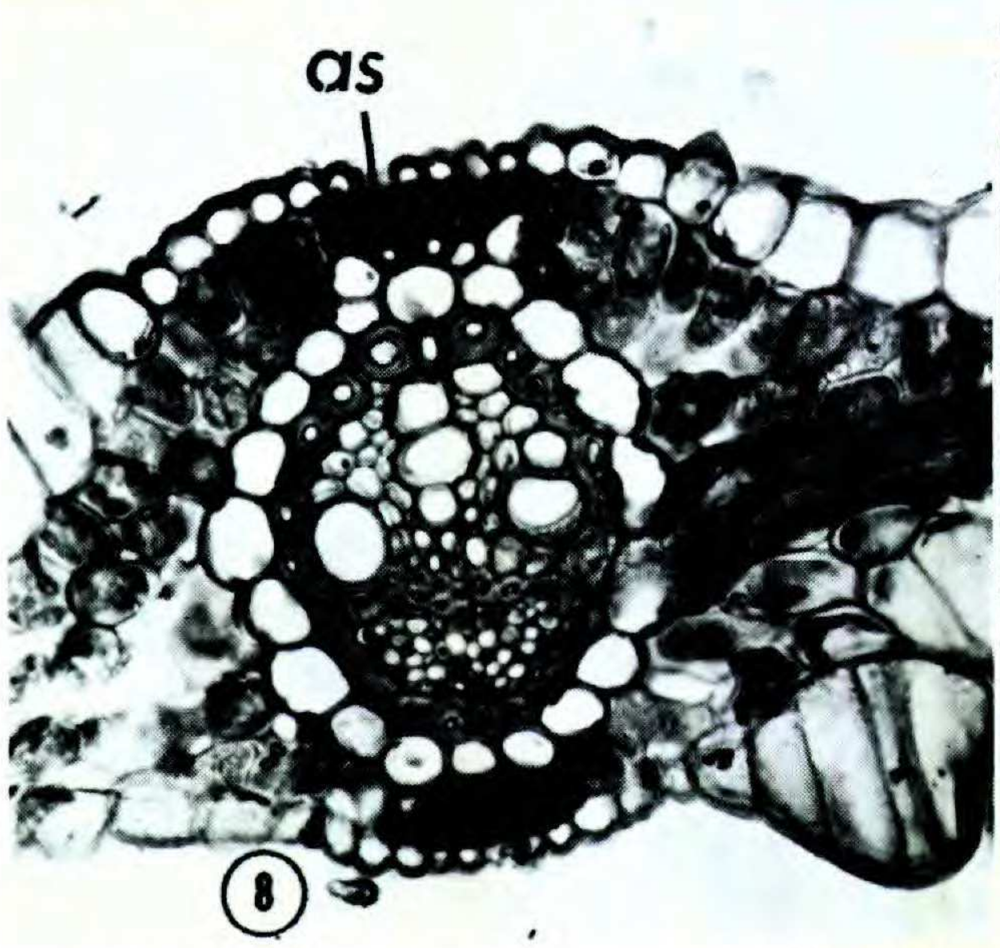

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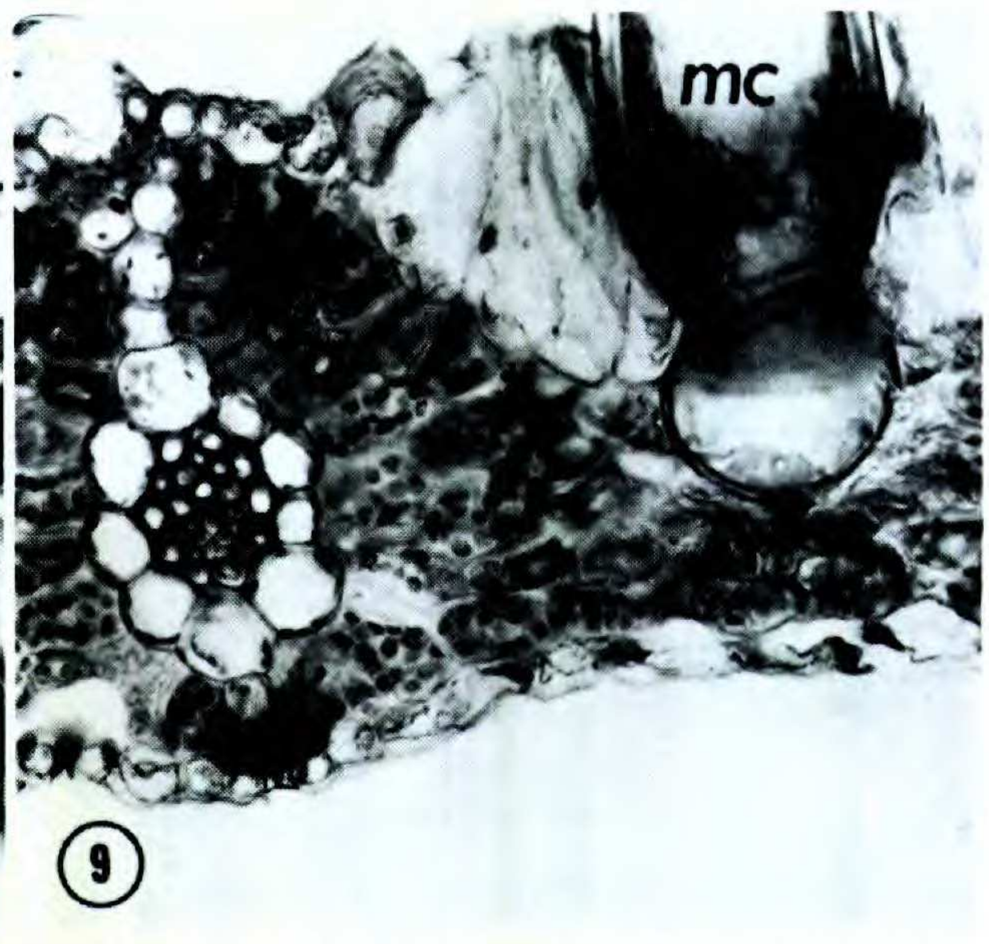

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FIGURES 6–9. Cross-section of leaf blades of *Lasiacis* species.—6. Primary vascular bundle of *L. anomala*; note the interrupted outer sheath.—7. Secondary vascular bundle of *L. anomala*.—8. Primary vascular bundle of *L. rhizophora*; note the continuous outer bundle sheath.—9. Secondary vascular bundle of *L. rhizophora*; note sunken base of macrohair. Abbreviations: as = adaxial sclerenchyma strand; is = inner bundle sheath; mc = macrohair; os = outer bundle sheath; pc = palisade chlorenchyma; sc = spongy chlorenchyma.

In all other species, SVBs may occasionally diverge from the MVB and in the appropriate cross-sections thus appear closely associated with the MVB. In these species, the association is not consistent throughout the length of the blade.

In *L. ruscifolia* and *L. anomala*, the OS of the PVBs is interrupted (Fig. 6). In all other species, the OS of the PVB is usually complete, but an interruption can be observed infrequently, in which case it is probably due to the lignification of the outer bundle sheath cells between the IS and the schlerenchyma girders.

One curious and anomalous observation was the presence of arm cells in the chlorenchyma of a single field collection (*D 2580*) of *L. anomala*. Examination of greenhouse progeny from the same plant sampled for the field collection failed to demonstrate these cells. Neither were they noted in field collections and greenhouse collections of *D 2522* and *D 2591*, both also collections of *L. anomala*. Arm cells are characteristically present in the chlorenchyma of bam-

TABLE 2. Anatomical character states for *Lasiacis* leaf blade cross-sections (adapted from Metcalfe, 1960).

Sclerenchyma
1. PVB with small adaxial and abaxial girders.
2. PVB with low, wide, somewhat triangular adaxial and abaxial girders.
3. PVB with combined adaxial and abaxial girders anchor-shaped.
Midrib
4. MVB single or occasionally with one or two closely associated SVBs.
5. MVB always with two closely associated SVBs.
Bulliform Cells
6. Bulliform cells conspicuously large, in regular group—*Zea* type.
7. Bulliform cells in well-defined, regular groups but only gradually larger than the remaining epidermal cells.
Chlorenchyma
8. Chlorenchyma of spongy layer conspicuously elongated and arranged perpendicularly to the palisade chlorenchyma.
9. Chlorenchyma with arm cells.
10. Chlorenchyma not conspicuously elongated or with arm cells.
Bundle Sheaths
11. IS and OS of PVB complete, sometimes with slight adaxial extension of colorless cells.
12. IS and OS of PVB complete, IS two or three cells wide below the phloem, OS variously multilayered.
13. IS of PVB complete; OS interrupted adaxially and abaxially.
14. IS of PVB complete; OS interrupted abaxially.
15. IS of PVB complete; OS interrupted adaxially.
16. OS of SVB with an adaxial extension of colorless cells.
17. OS of SVB with adaxial and abaxial extensions of colorless cells.

busoid grasses. The significance of these cells in a single *Lasiacis* collection is not known.

Leaf anatomy generally is not useful for specific identification since the overlap in anatomical chacteristics between different populations of the same species and different species is too great; however, at least *L. procerrima* and *L. oaxacensis* can be reliably identified on this basis. Türpe (1966) in a study of Argentinian species of *Paspalum*, on the other hand, was able to show the existence of many specific differences. However, she noted that leaf anatomy could better be correlated with the ecological habitats of the plants than their taxonomic position within the genus. Since the species of *Lasiacis* are not diverse ecologically, there may be a corresponding lack in anatomical distinctiveness.

LEAF BLADE EPIDERMIS

The epidermal cells of grass leaves are arranged in rows parallel to the long axis of the blade. The zone of cells over the veins, the costal zone, is usually conspicuously different in appearance from the zone between the veins, the intercostal zone (Figs. 16, 19–20). The epidermis of grass leaves contains a number of distinct cell types which in *Lasiacis* include long cells, short cells (both cork and silica cells), guard cells and associated subsidiary cells, microhairs, prickle hairs, and macrohairs.

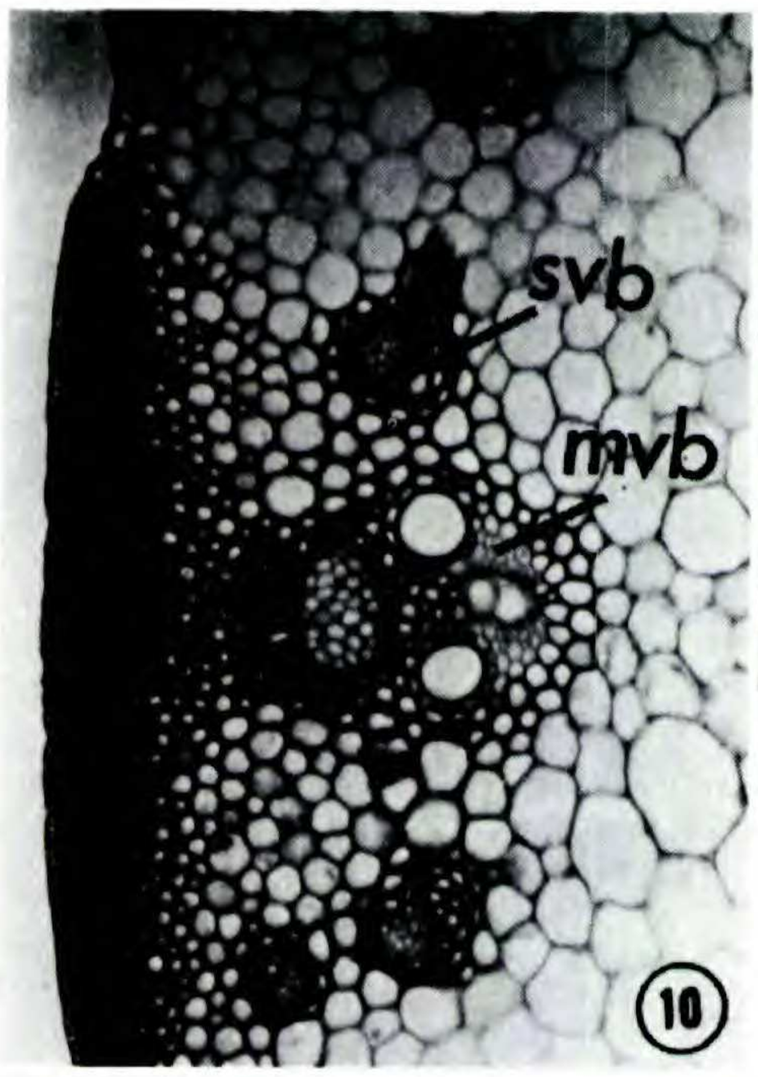
TABLE 3. Anatomical characteristics of *Lasiacis* species as seen in cross-sections of leaf blades.[a]

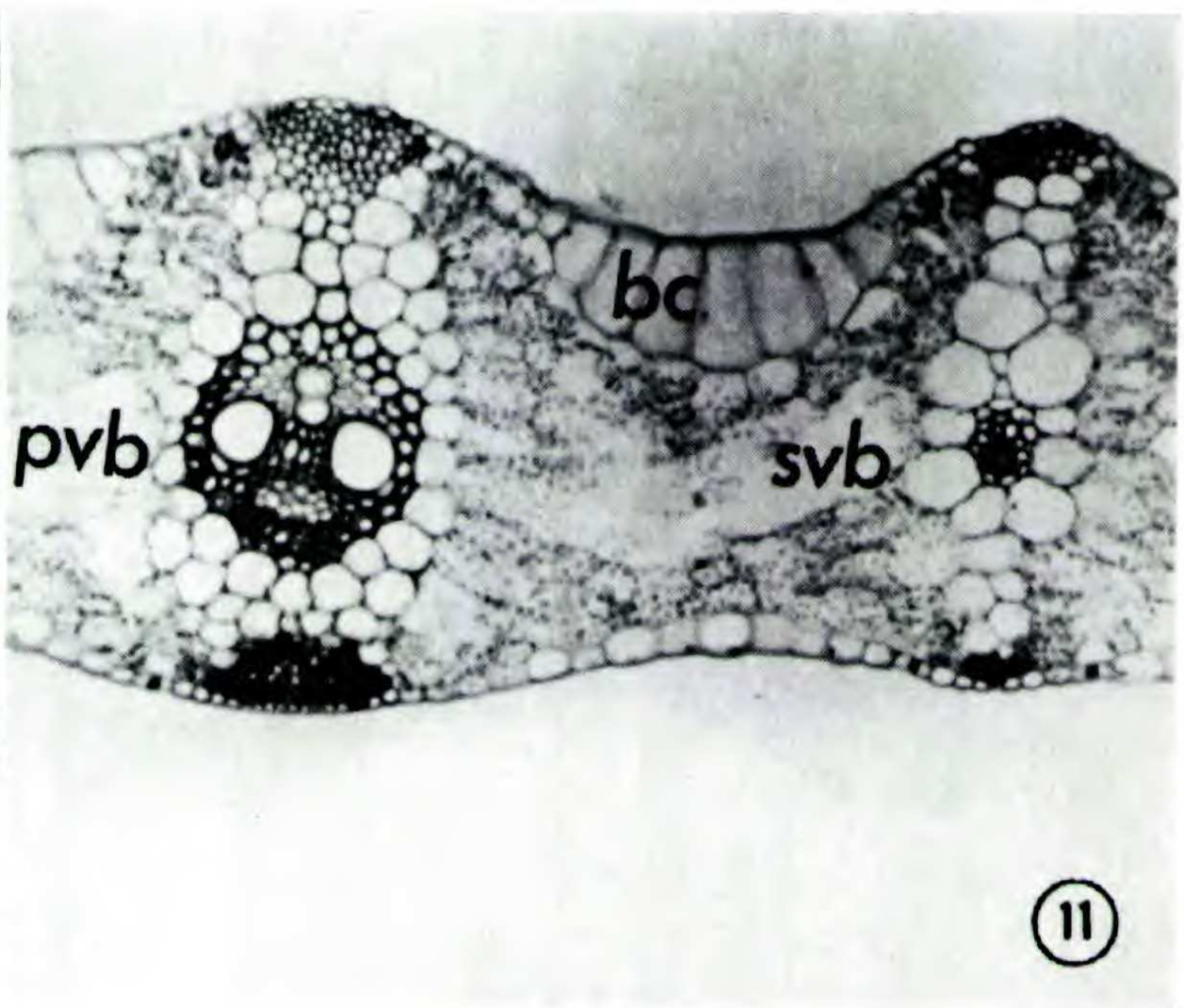
Species	Sclerenchyma	Midrib	Bulliform Cells	Chlorenchyma	Bundle Sheaths	
					PVB	SVB
L. anomala	1, 3[b]	4	7	9, 10	13, 14	16
L. divaricata var. *divaricata*	3	4	7	10	11, 14	16
L. ligulata	3	4	7	10	14	16
L. linearis	2-3[c]	4	7	10	11	16
L. nigra	1	4	7	10	11	16
L. oaxacensis var. *oaxacensis*	1-2	5	6	8, 10	11-13	16-17
L. oaxacensis var. *maxonii*	1-3	5	6	10	11	16
L. procerrima	2	5	6	8	12	17
L. rhizophora	1	4	7	10	11	16
L. ruscifolia var. *ruscifolia*	3	4	7	10	13, 14, 15	16
L. ruscifolia var. *velutina*	1-2	4	7	8, 10	11	16
L. scabrior	1	4	7	10	11	16
L. sloanei	3	4	7	10	11, 14	16
L. sorghoidea var. *sorghoidea*	3	4	7	10	11, 14	16

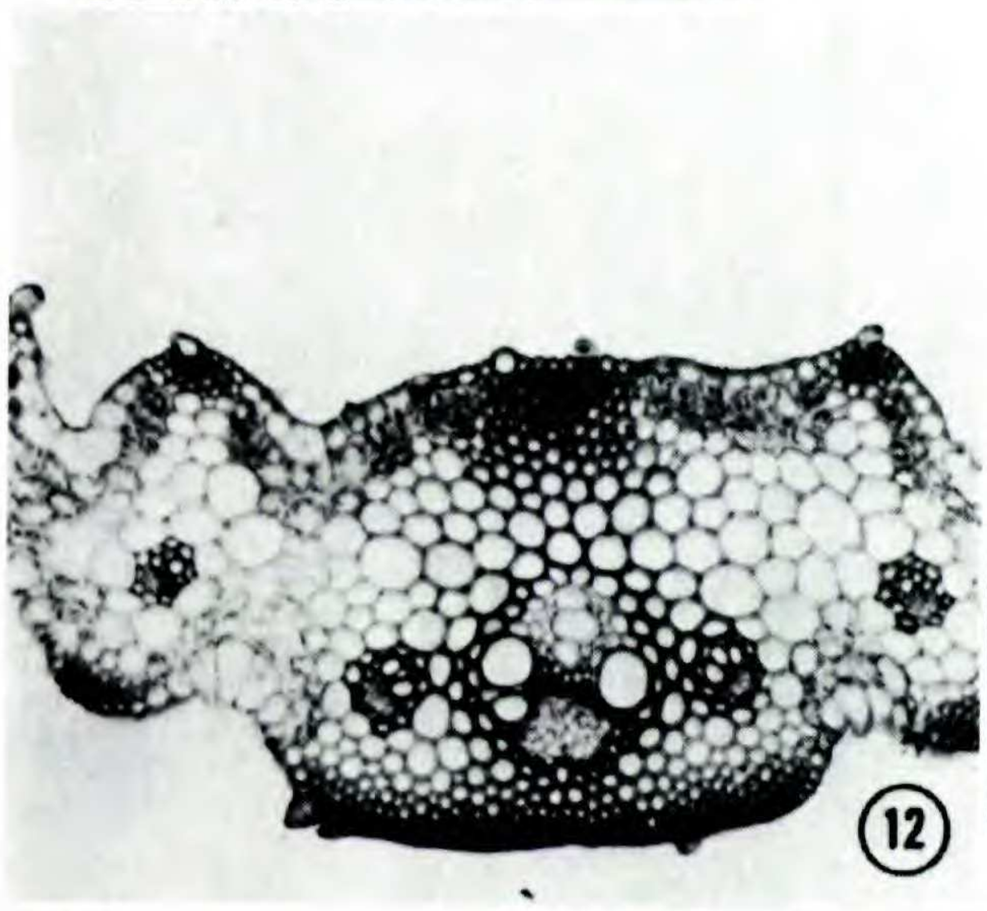
[a] Numbers in the table refer to the character states listed in Table 2.
[b] Numbers separated by a comma indicate that both character states have been observed in the taxon.
[c] Numbers connected with a hyphen indicate that an intermediate condition between the two indicated character states exist in the taxon.

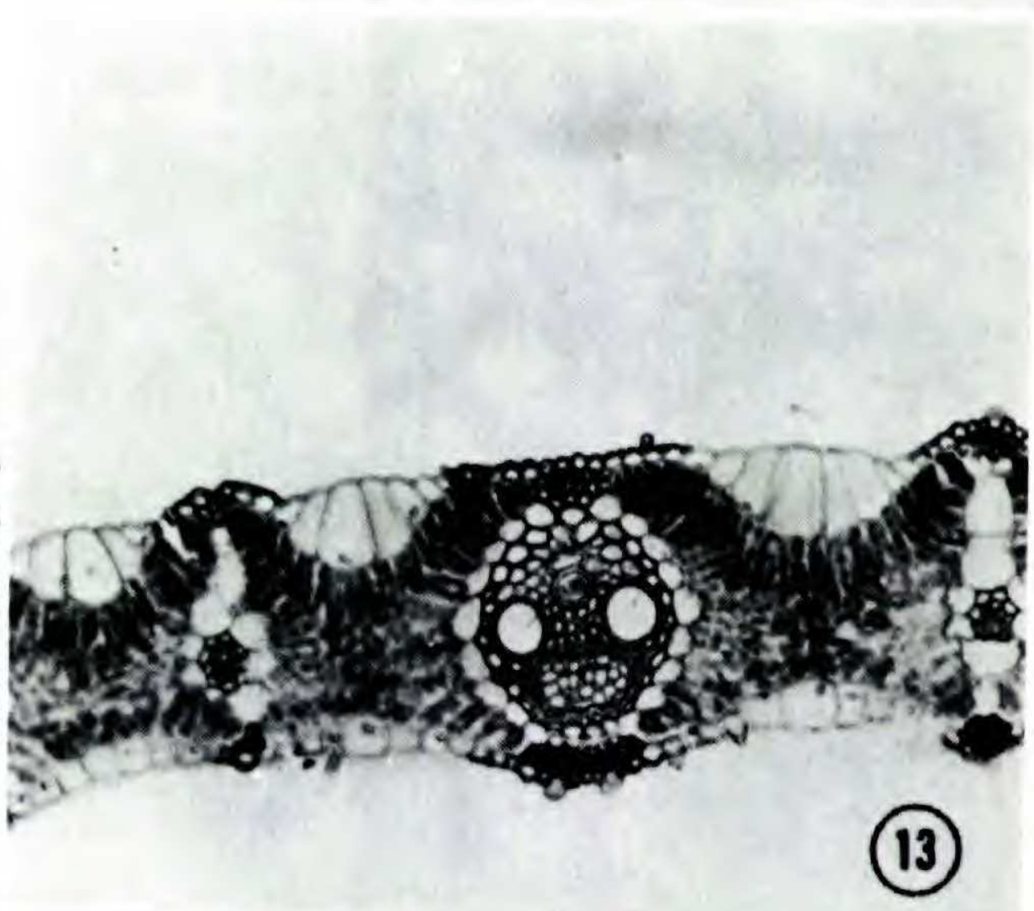
The following seven species have been examined for epidermal anatomy: *L. divaricata, D 2196*; *L. linearis, DP 2100*; *L. procerrima, Soderstrom s.n.*; *L. rhizophora, P 12489*; *L. scabrior, PD 11692*; *L. sloanei, DP 2200*; and *L. sorghoidea, PD 10790*. The following observations refer primarily to the adaxial epidermis, although the abaxial surface is quite similar. Long cells in the costal zones are relatively long and narrow with sinuous walls. Those of the intercostal zone vary, depending on the species, but are always larger than those of the costal zones. They may be nearly cubical or distinctly rectangular and possess sinuous or nearly straight cell walls. Between the costal and intercostal zones and associated with the PVBs is an intermediate zone of long cells in which the cells are like those of the costal zone but become wider and shorter toward the intercostal zone (Fig. 20).

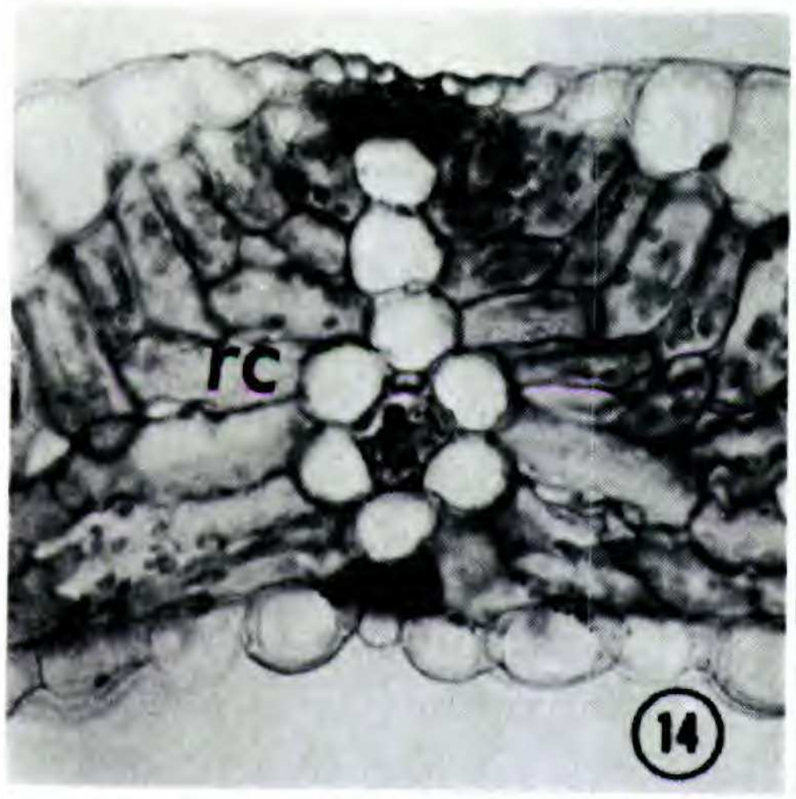
The short cells in the costal zones are arranged in long continuous rows, commonly with alternating silica and cork cells. The silica bodies within the silica cells are primarily dumbell shaped with a smaller number being nodular shaped (Figs. 17–20). No short cells occur in the intercostal zone. In the intermediate zone, short cells occur in pairs or occasionally singly, rather than in long rows as in the costal zone.

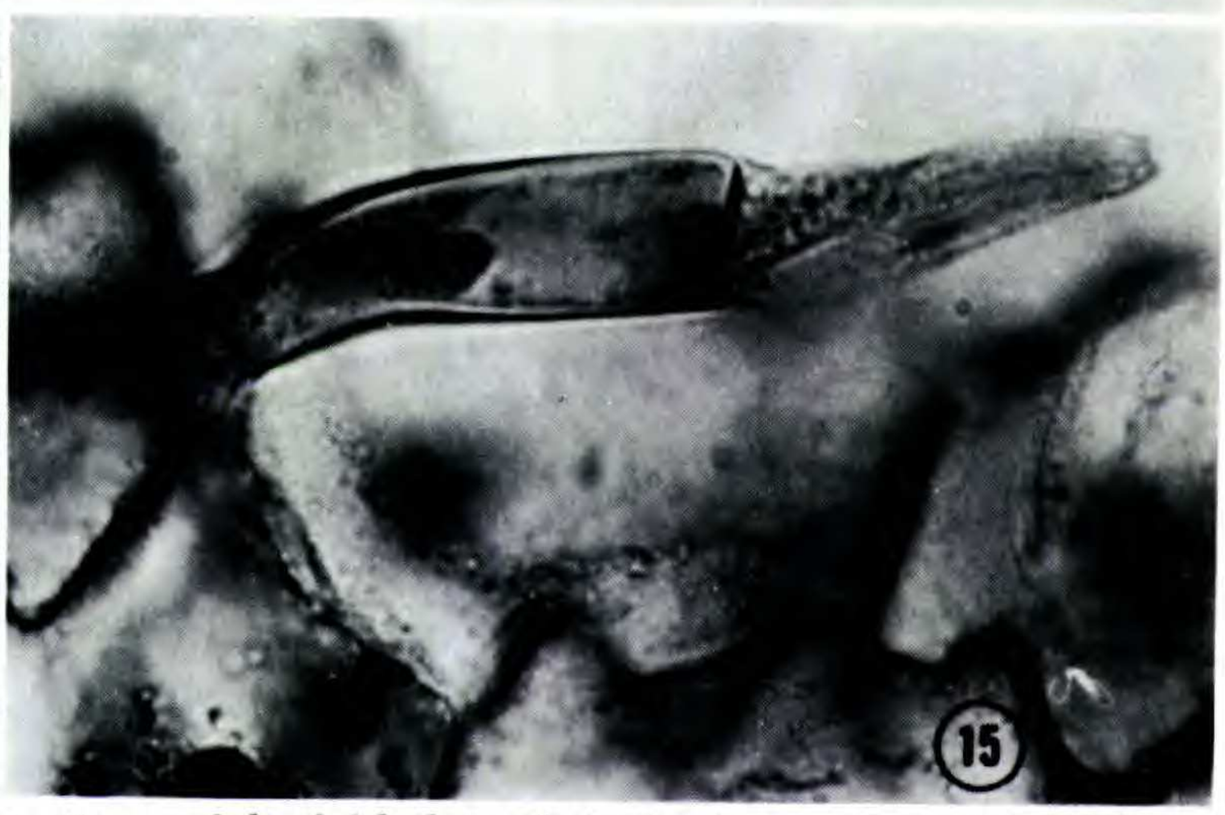












FIGURES 10–15.—10–14. Cross-sections of leaf blades of *Lasiacis* species.—10. Abaxial portion of the midrib of *L. procerrima*; note three secondary vascular bundles associated with the main vascular bundle.—11. Primary and secondary vascular bundles of *L. procerrima*.—12. Midrib of *L. oaxacensis* var. *oaxacensis*; note two secondary vascular bundles associated with the main vascular bundles.—13. Primary and secondary vascular bundle of *L. oaxacensis* var. *oaxacensis*.—14. Secondary vascular bundle of *L. rugelii* var. *pohlii*.—15. Biocellular microhair of *L. nigra*. Abbreviations: bc = bulliform cells; mvb = main vascular bundle; pvb = primary vascular bundle; rc = radial chlorenchyma; svb = secondary vascular bundle.

Stomata occur in one or two rows among the long cells on each side of the costal zone (Figs. 16, 19). The stomatal complex is made up of two dumbbell-shaped guard cells and two subsidiary cells. The shape of the subsidiary cells is typically triangular to low dome shaped (Figs. 16, 19).

Microhairs are bicellular (Fig. 15). The distal cells have much thinner cell walls than those of the basal cell and for this reason are often distorted. When undamaged, they can be observed to taper to a somewhat rounded point. In all but one of the six species examined, the ratio between the distal cell and the basal cell varied from 1.1:1 to 1.5:1. In *L. sorghoidea*, the basal cell was usually somewhat longer than the distal cell, the ratio varying from 1.2:1 to 1:1.2.

Angular prickle-hairs are present on the margins of all *Lasiacis* leaves. Prickle-hairs may also be present on the surface of the blade lamina, in which case they usually occur in rows interspersed among the short cells of the costal zone (Fig. 18). In *L. sloanei*, prickle-hairs were found in the intercostal zone.

Macrohairs vary greatly in size and shape. Their base is usually deeply sunken in the leaf surface and is surrounded by cushions of large cells (Fig. 9).

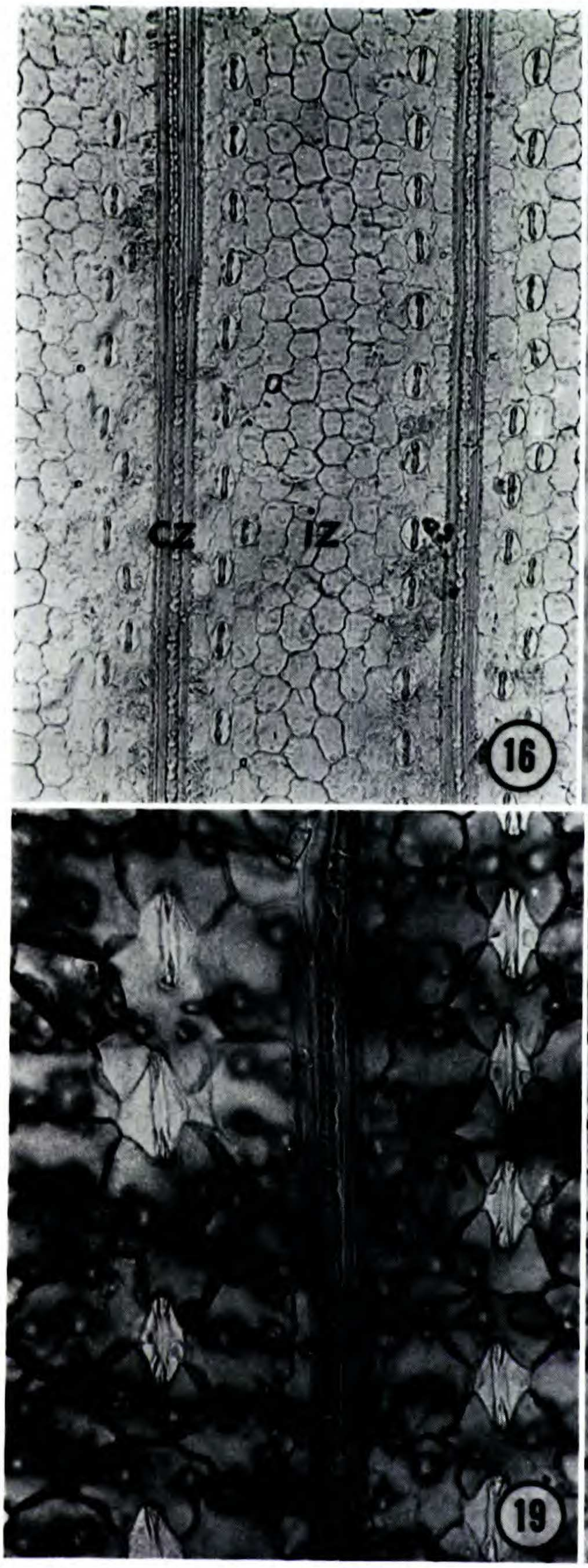
DISCUSSION

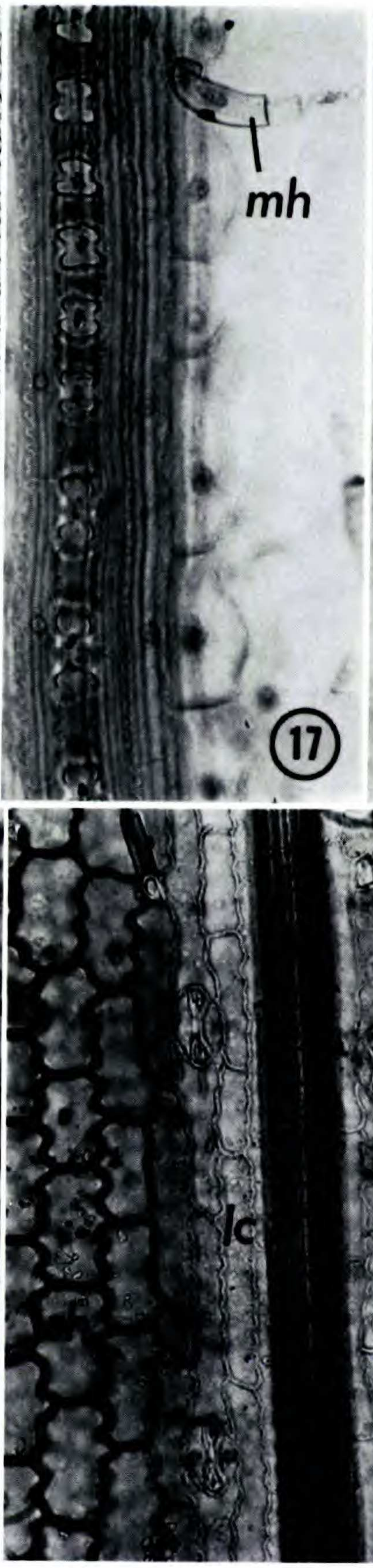
Anatomical characterization of the Panicoideae and the Bambusoideae has been made by Prat (1936), Brown (1958), Metcalfe (1960), and Gould (1968), among others. *Lasiacis* appears to be typically panicoid in the following characters: Angular SVBs, radiate chlorenchyma, short cells of costal zones in long rows, dumbbell- and nodular-shaped silica bodies, macrohairs with sunken bases, bicellular microhairs with thin-walled, tapering distal cells, and triangular- or dome-shaped subsidiary cells. In no anatomical characters is *Lasiacis* bambusoid. The contentions of Nuñez (1952) and Hsu (1965) of similarity to the bamboos in leaf anatomy must, therefore, he rejected. In their possession of an outer parenchyma bundle sheath whose cells have relatively large vacuoles, little cytoplasm, and few unspecialized chloroplasts, and in their possession of a starch-storing mesophyll differentiated into a palisade and spongy layer, all species examined have a non-Kranz anatomy that clearly indicates C_3 photosynthesis (Ellis, 1974; Smith & Brown, 1973). This agrees with the observations of Carolin & Jacobs (1973) who found *L. procerrima* to be non-Kranz on the basis of its parenchyma sheath, as did Smith & Brown (1973) on the basis of an analysis of carbon isotope ratios.

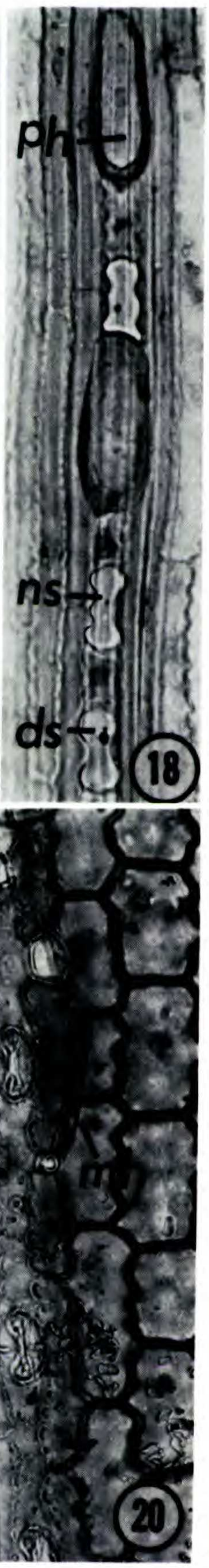
Breeding System

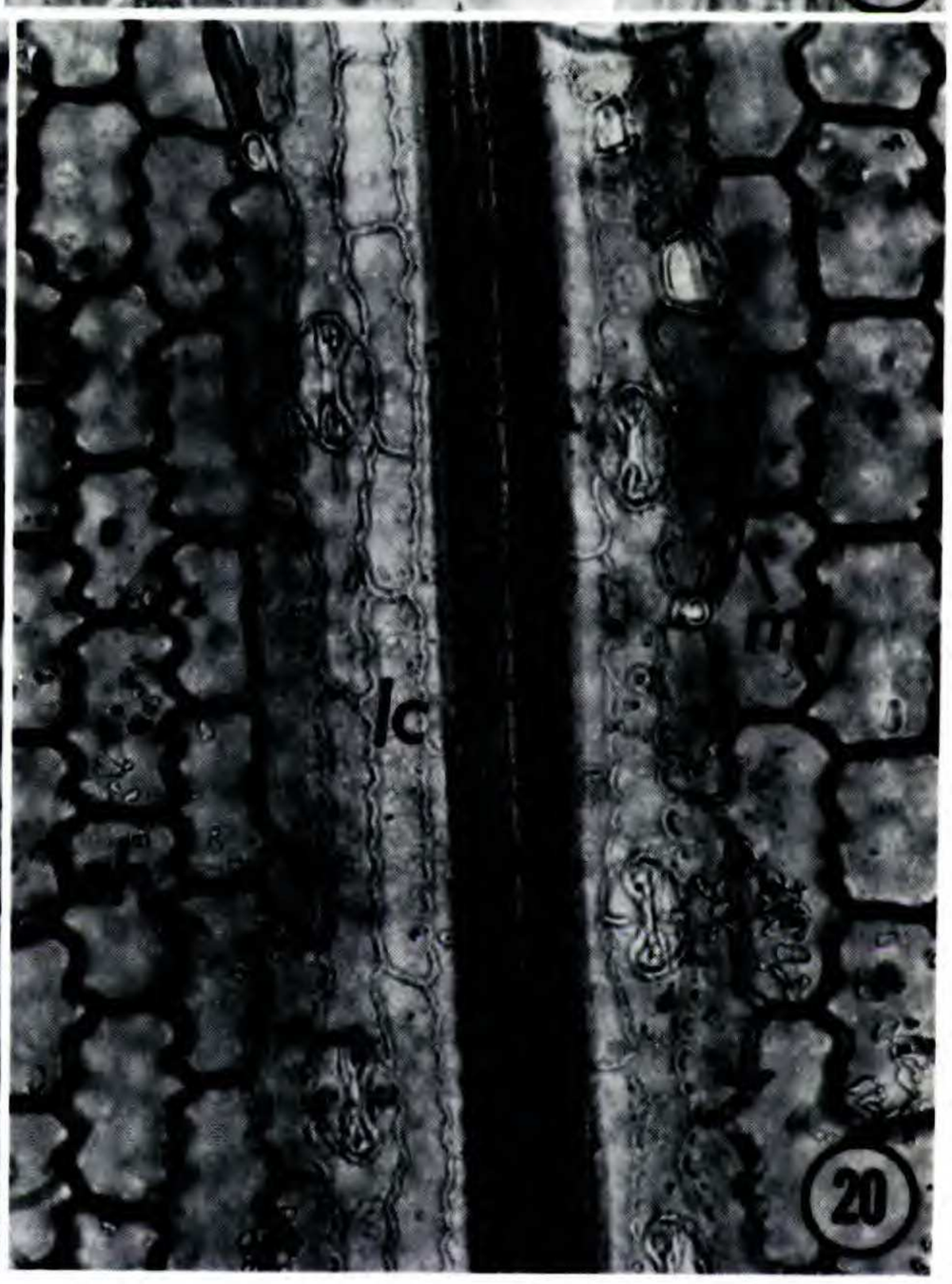
No information corncerning the breeding system of *Lasiacis* has been published. The following observations have been made in the greenhouse and in the field.

Anthesis in all species takes place in the morning, whether the plants are in the field or in the greenhouse. During anthesis, the lodicules force the lemma and palea of the fertile floret wide apart. This enables the coiled styles and filaments to straighten and to exsert the stigmas and anthers from the spikelet.









FIGURES 16–20. Paradermal view of the leaf blade epidermis of *Lasiacis* species.—16. Lower epidermis of *L. procerrima*; note the costal and intercostal zones.—17. Costal zone in the lower epidermis of *L. nigra*.—18. Costal zone in the upper epidermis of *L. scabrior*.—19. Lower epidermis of *L. rhizophora*.—20. Upper epidermis of *L. sloanei*. Abbreviations: cz = costal zone; ds = dumbbell-shaped silica body; iz = intercostal zone; lc = long cell; mh = microhair; ns = nodular-shaped silica body; ph = prickle-hair; sh = short cell.

TABLE 4. Determination of self-compatibility and percent of spontaneous fruit-set in isolated plants of *Lasiacis*.

Species	No. of collections tested for self-compatibility	No. of spikelets counted	% fruit-set
L. anomala	3	150	80
L. divaricata	7	380	90
L. linearis	1	25	60
L. procerrima	3	210	5
L. rhizophora	2	80	55
L. ruscifolia	5	500	95

The stigmas and anthers are always exserted simultaneously. Soon after exsertion, the spikelet closes again. When fully exserted, the anthers hang down on slender filaments and may be shaken in the wind. Pollen is then released into the air from a slit near the apex of the anther. Anther dehiscence is dependent upon environmental conditions, especially soil moisture and atmospheric humidity. Under dry conditions, dehiscence may take place very soon after exsertion of the anthers. Under hot, very humid conditions or in rain, dehiscence may be greatly or completely retarded. The feathery stigmas are receptive within an hour after exsertion.

All species tested in the greenhouse (Table 4) proved to be self-compatible.

Self-compatibility, simultaneous exsertion of stigmas and anthers, simultaneous pollen release, and simultaneous stigmatic receptivity suggest that selfing is the dominant mode of pollination. Controlling pollination by isolating plants showed this to be the case. Fruit-set under these conditions usually varied from 55–95%. *Lasiacis procerrima* was notable in its 5% fruit-set. Even hand pollination between different plants of *L. procerrima* failed to improve fruit set appreciably. It is possible that stigmas may be receptive much later than in the other species, but this has not been investigated.

Self-pollination under natural conditions is undoubtedly the most important mode of pollination. A certain amount of cross-pollination probably also takes place. This is especially expected in crowded, dense populations where inflorescences of different plants would often intermingle. Under such conditions, wind-borne pollen would facilitate cross-pollination. Even then, pollination within an inflorescence is still most likely. Furthermore, in such populations most plants might be expected to have been derived from seed formed by self-pollination. Intrapopulational genetic diversity would, therefore, be low, and occasional outcrossing would not be highly effective in maintaining genetic variability. No information is available on the competition of foreign pollen with pollen from the same plant as the stigmas. If foreign pollen had a competitive advantage, this might increase the effectiveness of the small amount of cross-pollination that takes place.

One factor that may tend to increase the chance of cross-pollination is the

occurrence of staminate flowers in the sterile florets of some species. In the greenhouse, it is not uncommon to find only anthers from these staminate flowers exserted on a particular day. In a natural population, this could effectively increase the amount of pollen available for cross-pollination.

Deviation from the typical process of anthesis and pollination may take place. This results from the failure of the stigmas and anthers to be fully exserted at anthesis. When this happens, usually only the tips of the anthers and stigmas emerge from the spikelet. Less commonly, the anthers and stigmas remain entirely included within the lemma and palea after it closes again. The opening and closing of the lemma and palea can cause dehiscence of the anthers and may effectively distribute pollen on the stigmas. Such pseudocleistogamy has been observed in occasional spikelets of most greenhouse plants.

Grasses are generally recognized as anemophilous plants. However, some tropical forest grasses are pollinated, at least in part, by insects (Soderstrom & Calderón, 1971). Even some temperate-zone grasses such as *Zizania aquatica* are sometimes visited by bees collecting pollen (Thieret, 1971). I have not observed any insect visitation to any *Lasiacis* species in the field. If such visits do occur, effective pollination, especially cross-pollination, would probably seldom take place.

As with the majority of flowering plants (Baker, 1959), *Lasiacis* species have a system of mixed outbreeding and inbreeding, with inbreeding the dominant force. With such a predominantly autogamous breeding system, variation within local populations is theoretically expected to be minimal (Baker, 1959; Grant, 1971), and this is what is observed in the field. Occasional outcrossing would, however, presumably be adequate to maintain a fairly high level of genetic variability in the species as a whole.

CHROMOSOME NUMBERS

New chromosome number determinations for 101 collections of *Lasiacis* are listed in Table 5. Also included in Table 5 are previous reports of chromosome numbers for ten collections representing six species (Parodi, 1946; Nuñez, 1952; Tateoka, 1962; Gould & Soderstrom, 1967, 1970; Reeder, 1967, 1968). Of the 16 species recognized in this study, 3 (*L. grisebachii*, *L. rugelii*, and *L. scabrior*) remain cytologically unknown.

Reeder (1968) reported *L. sloanei* to have $n = 18$. However, the plant upon which it is based is the glabrous form of *L. nigra*. The voucher lacks the long, well-separated panicle branches of *L. sloanei*, and the spikelets are not short-pedicelled and appressed to the panicle branches. Furthermore, the spikelets are purple, a character unknown in *L. sloanei*, and the leaves lack the short, densely puberulent pseudopetiole of *L. sloanei*.

The counts reported by Parodi (1946) and Nuñez (1952) were probably based on *L. divaricata* var. *austroamericana*, since only this variety of *L. divaricata* occurs in Argentina. I have not seen any voucher specimens for these counts.

The chromosome number $n = 18$ has now been determined for 111 collections of *Lasiacis*. Pairing was complete and no irregularities were noted in my prepara-

TABLE 5. Chromosome numbers and voucher specimens for *Lasiacis* species.

L. anomala; $n = 18$[a]

VENEZUELA: Bolívar: 13 km ESE of Upata, *D et al. 4617*. Guárico: 10 km SSE of Calabozo, *D 2916*, *D 3690*; 5.5 km W of Guayabol, *D 3001*; 80 km S of Las Mercedes, *D 4272*. TRINIDAD: 2 mi NE of Piarco, *D 2591*, *D 2591B*, *D 2592*; Between Piarco and Piarco Int. Airport, *D 2522B*, *D 2523A*; Irois Bay, *D 2580A*.

L. divaricata var. *divaricata*; $n = 18$, $2n = 36$[a]

NICARAGUA: Zelaya: Río Coco at Bilwaskarma, *DP 2295A*. HONDURAS: Atlantida: 17 km SSE of La Ceiba, *DP 2196A*.[b] JAMAICA: St. Thomas Parish: 2.3 mi N of Eleven-Mile Intersection, *D & Conroy 3258*.[b] DOMINICAN REPUBLIC: Barahona: 12 km NNE of Polo, *D 2721*. UNITED STATES: Florida: Monroe Co., 10 mi NE of Flamingo, *Weatherwax*.

L. divaricata var. *austroamericana*; $n = 18$, $2n = 36$

ARGENTINA, no vouchers indicated (Parodi, 1946; Nuñez, 1952).[c] BRAZIL: São Paulo: Ca. 38 km SW of Jacupiranga, *D et al. 10948*.

L. harrisii; $n = 18$[a]

JAMAICA: Portland Parish: Muriel's Rock, *D & Proctor 3242*.

L. ligulata; $n = 18$

SURINAM: Zuid Rivier, *Irwin et al. 55790B*[d] (Gould & Soderstrom, 1967). COLOMBIA: Caquetá: *Soderstrom 1415*[e] (Gould & Soderstrom, 1970). BRAZIL: Minas Gerais: Ca. 8 km N of Teófilo Otoni, *D et al. 11500*; Ca. 27 km SE of Coroaci, *D et al. 11477*.

L. linearis; $n = 18$[a]

HONDURAS: Morazán: Cerro La Tigre, 11 km NE of Tegucigalpa, *DP 2121*; Cerro Uyuca, *DP 2100C*, *DP 2106*.

L. nigra; $n = 18$

MEXICO: San Luis Potosí: 41 mi W of San Luis Potosí, *Reeder & Reeder 4765*[f] (Reeder, 1968). Michoacán: Ca. 1.7 mi NW of Tuxpan, *DD 9819*. Chiapas: Ca. 8 mi NE of Solistohuacan, *DD 9458*. EL SALVADOR: Libertad: Volcán de San Salvador, *DP 2025*. HONDURAS: Morazán: Cerro La Tigre, 10 km NE of Tegucigalpa, *DP 2119*. El Paraíso: 7 km NW of San Lucas, *PD 12161*. COSTA RICA: Alajuela: 10 km N of San Ramón, *PD 11275*. Cartago: Moravia de Chirripó, *PD 11870*; 25 km SW of Tejar, *PD 11134*. San José: 2 km NNE of San Gabriel, *PD 11051*. PANAMA: Chiriquí: E slope of Volcán de Chiriquí, *D & D'Arcy 10155*. VENEZUELA: Aragua: Rancho Grande, *D 3033*; Alto de Choroní, *D 3100*. Distrito Federal: Rd. to Carayaca, *D & Morillo 3999*. Mérida: 66 km NE of Mérida, *D 3240*.

L. oaxacensis var. *oaxacensis*; $2n = 36$[a]

EL SALVADOR: Libertad: Volcán de San Salvador, *DP 2026A*.[b]

L. oaxacensis var. *maxonii*; $2n = 36$[a]

HONDURAS: Yoro: 15 km SSE of Río Viejo, *DP 2199A*.[b]

L. procerrima; $n = 18$, $2n = 36$[a]

MEXICO: Chiapas: 5 mi N of Ixtacomitan, *DD 9435*. EL SALVADOR: Chalatenango: 7 km SSE of La Palma, *DP 2072*. NICARAGUA: Zelaya: Intersection of Waspam-Puerto Cabeza Rd. and Río Lecus, *DP 2347*, *2347A*,[b] *PE 12701*. HONDURAS: Morazán: Between San Juancito and Valle de Angeles, *DP 2125*; Between El Zamorano and San Antonio de Oriente, *DP 2161*. El Paraíso: 32 km W of Danlí, *DP 2146*. COSTA RICA: Guanacaste: 8 km E of Liberia, *PD 10639*; 10 km NE of Las Juntas, *PD 10960*. Puntarenas: Near San Vito de Java, *PD 11163*. COLOMBIA: Caquetá: Florencia, *Soderstrom A*, *C*, *E*; 70 km SE of Guadalupe, *D et al. 5638*. Cundinamarca: 20 km NW of Villavicencio, *D & Llanos 5523*. VENEZUELA: Bolívar: La Gran Sabana, *D et al. 4783*.

L. rhizophora; $n = 18$, $2n = 36$

MEXICO: Chiapas: Sierra Madre, *Tateoka 1030*[b,d] (Tateoka, 1962). HONDURAS: El Paraíso: 8 km W of Yuscaran, *PE 12748*. Morazán: Cerro Uyuca, *P 12489*, *P 12489A*. COSTA RICA: San José: S of Curridabat, *PD 11694A*; 1 mi N of San Gabriel, *PD 11179*. PANAMA: Chiriquí: E slope of Volcán de Chiriquí, *D & D'Arcy 10158*.

TABLE 5. (Continued)

L. ruscifolia var. *ruscifolia*; $n = 18$, $2n = 36$

MEXICO: Chiapas: Mapestepec, *Tateoka 1001*[b,d] (Tateoka, 1962); Ca. 2 mi NW of the Tehuantepec-Tapachula intersection, *DD 9571*. Veracruz: Santiago Tuxtla, *Reeder 4333*[e] (Reeder, 1967). San Luis Potosí: Near Xolol, *PD 11808*, *PD 11808B*. EL SALVADOR: Santa Ana: 11 km E of Metapán, *PE 12583*. HONDURAS: Atlantida: 9 km E of Tela, *DP 2188*. Cortes: 1 km S of Puerto Cortes, *DP 2169*. COSTA RICA: Guanacaste: Hacienda Murciélago, *PD 11562A*. Puntarenas: 1.5 km S of the Puntarenas-Interamerican Highway jct., *PD 11278*. COLOMBIA: Caquetá: *Soderstrom 1415*[e] (Gould & Soderstrom, 1970). VENEZUELA: Guárico: 14 km N of Dos Caminos, *D 3012*;[b] 15 km SW of Tamaco, *D 4220*.

L. ruscifolia var. *velutina*; $n = 18$[a]

HONDURAS: Morazán: Between El Zamorano and San Antonio de Oriente, *DP 2162*.

L. sloanei; $n = 18$[a]

MEXICO: Oaxaca: 8 mi NE of Valle Nacional, *DD 9732*. HONDURAS: Yoro: 19 km SE of Río Viejo, *DP 2200*. COSTA RICA: Guanacaste: 30 km N of Cañas, *PE 12637*. Puntarenas: Road to Boruca, *PD 10994*.

L. sorghoidea var. *sorghoidea*; $n = 9$

COLOMBIA: Caquetá, *Soderstrom 1407*[d] (Gould & Soderstrom, 1970).

L. sorghoidea var. *sorghoidea*; $n = 18$, $2n = 36$[a]

COSTA RICA: Puntarenas: Finca Las Cruces, near San Vito de Java, *PD 10790C*.[b] PANAMA: *Morton B.* VENEZUELA: Amazonas: Isla Carestía, 5 km NNW of Sanariapo, *D 2875*; 12.5 km S of Puerto Ayacucho, *D 2785*; 20 km S of Puerto Ayacucho, *D 2839*. Apure: 42 km NW of Achaguas, *D et al. 3923*. Bolívar: La Gran Sabana, *D et al. 4782*; El Pao Viejo, *D et al. 4968*. Barinas: 43 km NW of Barinas, *D 3194*; 31 km NW of Barinas, *D 3184*. Distrito Federal: 19.8 km S of Carayaca, *D 2902*. Guárico: 10 km S of San Juan de los Morros, *D 3015*. Portuguesa: 20 km NE of Guanare, *D 3149*. COLOMBIA: Caquetá: 55 km SE of Guadalupe, *D et al. 5629*; 10 km SW of Belén, *D et al. 5690*; 8 km SW of San José del Fragua, *D et al. 5727*. Cundinamarca: 20 km NW of Villavicencio, *D & Llanos 5522*. Huila: 6 km SE of Altamira, *D et al. 5585A*; 10 km SE of Guadalupe, *D et al. 5605*. JAMAICA: St. Andrew Parish: Silver Hill, *D & Proctor 3247*; Above Gordon Town, *D & Proctor 3250*.

L. sorghoidea var. *patentiflora*; $n = 18$[a]

VENEZUELA: Mérida: 32 km NE of Mérida, *D 3232*. COLOMBIA: Caquetá; 15 km SW of Belén, *D et al. 5692*.

L. standleyi; $n = 18$[a]

COSTA RICA: San José: Between La Hondura and La Palma, *PD 11210*.

[a] First count recorded for this taxon.
[b] Root tip count.
[c] Originally reported as *L. divaricata* (see text).
[d] Voucher seen.
[e] Voucher not seen.
[f] Originally reported as *L. sloanei* (see text).

tions (Figs. 21–22) nor have previous authors reported any irregularities. For one collection of *L. sorghoidea* from the Florencia region of Caquetá, Colombia, the number $n = 9$ has been reported (Gould & Soderstrom, 1970). This diploid is morphologically similar to tetraploids of the same species.

From this limited sample, it seems clear that *Lasiacis* populations are basically tetraploid. It can also be reasonably surmised that most of the speciation has taken place at this level and that polyploidy, after its initial establishment in the ancestral species of the genus, has played little or no further part in the evolution

FIGURES 21–22. Meiotic chromosomes of *Lasiacis* species.—21. *L. sorghoidea* var. *sorghoidea*, *Morton B*, $n = 18$, diakinesis.—22. *L. linearis*, *Davidse & Pohl 2121*, $n = 18$, metaphase I.

of the group. The genus as a whole seems to have become secondarily diploidized at the 4*x* level.

The single diploid count reported by Gould & Soderstrom (1970) for *L. sorghoidea* from Caquetá, Colombia, is surprising since all other counts now known are at the tetraploid level. I have examined four other populations of *L. sorghoidea* from the region in Florencia in Caquetá, Colombia, and found all to be tetraploid. This suggests that an error may have been involved in the report of the diploid count. Another possibility is that the presumed diploid represents a secondary derivative through haploidization. Raven & Thompson (1964) and de Wet (1971) have pointed out that there is no theoretical reason why haploidy, and in particular polyhaploidy, could not have played a role in the evolution of some plant groups. However, without more evidence, it is best not to place too much importance on this single diploid count.

The Paniceae typically have a base number of $x = 9$ or 10 and small- or medium-sized chromosomes (Stebbins, 1956; Gould, 1968). In this respect *Lasiacis* is typically panicoid. All species investigated have a base number of $x = 9$ with medium-sized chromosomes; Nuñez (1952) after studying mitotic chromosomes of *L. divaricata* stated that its chromosomes were larger than any panicoid studied by him except *Pennisetum*. My impression on the basis of studying meiotic chromosomes of a large number of American tropical grasses (Pohl & Davidse, 1971; Davidse & Pohl, 1972a, 1972b, 1974, 1978) is similar. *Lasiacis* chromosomes are among the largest of the American Paniceae, but are distinctly smaller than those of typical Pooideae.

TAXONOMY

Lasiacis (Griseb.) Hitchc., Contr. U.S. Natl. Herb. 15: 16. 1910.

Panicum sect. *Lasiacis* Griseb., Fl. Brit. W. Ind. 551. 1864. TYPE: *Panicum divaricatum* L. = *Lasiacis divaricata* (L.) Hitchc.

Plants perennial, rarely annual in *L. procerrima*; culms freely branched, caespitose, highly lignified and erect, arching or climbing, or procumbent and nearly herbaceous, creeping, and rooting the nodes; internodes solid or hollow; culm pulvini well developed; sheaths rounded, the margins free and overlapping; ligules membranous, ciliate or glabrous; collar sometimes somewhat enlarged to form a small pseudopetiole; blades linear to ovate, slightly to prominently asymmetrical at the base; inflorescence an open or contracted panicle; spikelets subglobose to globose, obovate or elliptic, placed obliquely on the pedicel; disarticulation below the glumes; glumes and sterile lemmas broad, abruptly apiculate, membranous, shiny black at maturity, lanate at the apex; first glume ⅓ to ⅔ the length of the spikelet, 5- to 13-nerved, saccate at the base, the margins overlapping; second glume and sterile lemma subequal, about as long as the fertile floret, 7- to 15-nerved, the sterile lemma enclosing a palea ¼ to equal the length of the fertile floret; sterile floret with or without a staminate flower; a second sterile lemma present in *L. anomala*; cells of the inner epidermis of the glumes and sterile lemmas filled with oil globules at maturity; fertile lemma indurate, obtuse, the margins inrolled enclosing the edges of the indurate palea, usually dark brown at maturity, broadly elliptic to obovate; palea gibbous above, concave below, its margins lobed, overlapping or meeting on the dorsal side of the caryopsis; both fertile lemma and palea with woolly pubescence in slight excavations at their apices; rachilla sometimes prolonged beyond the base of the fertile floret; stamens 3; styles 2, the bases separate; lodicules 2, fleshy, truncate, vasculated, 1 limb within the fertile palea, the other situated between the fertile lemma and palea; caryopsis plano-convex, ovate, obovate, or nearly orbicular, the apex rounded, sometimes broadly grooved on the hilum side; hilum oblong or nearly round; embryo approximately ½ the length of the caryopsis.

Lasiacis forms a natural, distinct group whose generic rank has not been questioned since Hitchcock & Chase (1910) raised the group to generic level. Although the basic spikelet structure of *Lasiacis* is similar to that of *Panicum*, *Lasiacis* does possess and is characterized by a number of distinctive modifications of that basic type. These characters are the nearly globose spikelets borne obliquely on the pedicels, woolly pubescence at the apex of the spikelet bracts, black coloration at maturity, oil production in the inner epidermis of the glumes and sterile lemmas at maturity, broadly ovate to obovate fertile florets and caryopses, and the fertile paleas concave below and gibbous above.

In previous sections, I have shown that *Lasiacis* is typically panicoid in features of vegetative and spikelet morphology, leaf anatomy, and chromosome number and size. Reeder (1957) in his classic study of grass embryos showed that *Lasiacis* is typically panicoid in embryo morphology also. The embryo is characterized by the possession of a distinct internode between the coleoptile

and scutellum, a cleft between the scutellum and coleorhiza, a primary leaf with numerous vascular bundles and overlapping margins, and the absence of an epiblast (Reeder, 1957).

Hsu (1965) in his studies of genera of Paniceae determined *Lasiacis* to have the following characteristics: bony-indurate, smooth lemmas; lemmatal epidermis with longitudinally rippled ridges, microhairs, and two to four aggregate granular silica cells; plicate, somewhat corky lodicules with numerous vascular bundles; distinct style bases; punctiform hilum. Hsu believed all these to be unspecialized characters and on this basis considered *Lasiacis* to be among the most primitive genera in the tribe. He further determined *Acroceras* and *Commelinidium* to be closely related to *Lasiacis* and speculated that *Lasiacis* probably resembles the ancestor of the tribe more closely than any other extant genus.

Butzin (1970a, 1970b) has proposed a new subtribe, Microcalaminae, of the Paniceae, based largely on the presence of cross-veins in the leaves, but also on inflorescence type, spikelet compression, and orientation of the lemmas. Included are *Lasiacis*, *Acroceras*, *Commelinidum*, and 16 other genera. This subtribe is considered to be phylogenetically basal in the tribe, with *Lasiacis* being one of the most primitive genera (Butzin, 1970a, 1970b).

If, as Butzin and Hsu have done, one assumes that the Paniceae arose from a generalized bambusoid stock which had woody culms, cross-nerved leaves, large diffuse panicles, spikelets round in cross-section, awnless lemmas, and indurate fertile florets, then *Lasiacis* should indeed be considered primitive. It may further be noted that such an ancestral stock probably had more than two florets per spikelet. The tendency to produce extra bracts in some *Lasiacis* species (an extra sterile lemma in *L. anomala*, and sterile projections at the base of the fertile floret, representing an extra fertile floret, in *L. ruscifolia* and *L. grisebachii*) further strengthens the speculative relationship with a primitive bambusoid stock.

In most Spanish-speaking countries, *Lasiacis* species are generally known by the name *carrizo* or the diminutive *carricillo*. The name is not used for *Lasiacis* alone but is employed in a collective sense for large woody, scandent grasses such as some of the bamboos and *Olyra*. In Portugese, the name *taquarí* seems to be employed in the same sense. Standley & Record (1936) reported that the Mayan word for these kinds of grasses is *zit*. Other, more local names, are listed after the species for which it has been reported.

Key to the Species

1. Spikelets with 2 glumes and 2 sterile lemmas subtending the fertile floret .... 1. *L. anomala*
1′. Spikelets with 2 glumes and 1 sterile lemma subtending the fertile floret.
  2. Culms solid, pithy; plants normally creeping and rooting at the lower nodes.
    3. Ligules inconspicuous, 0.4–1.1 mm long, ciliate; leaf blades lanceolate, 8–13 (–17) cm long, 1.6–3.7 cm wide ..... 10. *L. rhizophora*
    3′. Ligules conspicuous, 1.4–6.0 mm long; leaf blades linear-lanceolate, 13–29 cm long, 0.8–2.4 cm wide.
      4. Sheaths glabrous; spikelets borne in pairs or singly in small clusters toward the end of the panicle branches; lower floret usually staminate, its palea subequal in length to the fertile floret.
        5. Ligules (2.0–)2.6–5.0(–6.0) mm long ..... 8a. *L. oaxacensis* var. *oaxacensis*
        5′. Ligules 0.5–1.5 mm long ..... 8b. *L. oaxacensis* var. *maxonii*

4′. Sheaths puberulent to pubescent; spikelets borne singly on long pedicels toward ends of the panicle branches; lower floret lacking a flower, its palea ⅔ or usually less the length of the fertile floret ..... 6. *L. linearis*

2′. Culms hollow or partially hollow with some pith remnants; plants creeping and rooting at the lower nodes, or erect, arching, and/or climbing.

6. Plants creeping and rooting at the lower nodes.

7. Ligules inconspicuous, 0.3–0.7 mm long; sterile palea equal or subequal in length to the fertile floret.

8. Blades 0.6–1.1(–1.4) cm wide ..... 3a. *L. grisebachii* var. *grisebachii*

8′. Blades 1.5–2.0 cm wide ..... 3b. *L. grisebachii* var. *lindelieana*

7′. Ligules conspicuous, (4.5–)5–7(–9.0) mm long; sterile palea less than ½ the length of the fertile floret ..... 16. *L. standleyi*

6′. Plants erect.

9. Leaf blades conspicuously cordate-clasping, (14–)18–32(–42) cm long; lower nodes decumbent, forming conspicuous prop roots; inflorescences (20–)32–120 cm long ..... 9. *L. procerrima*

9′. Blades not conspicuously cordate, smaller, 2.5–14(–18) cm long; plants without conspicuous prop roots; inflorescences smaller, 2–30(–34) cm long.

10. Ligule of the upper leaves evident, (1.6–)2.0–6.0(–7.0) mm long.

11. Panicle spherical, small, usually less than 9 cm long, the base included in the upper sheath, only rarely completely exserted; upper surface of the blade scabrous; ligule mostly 4–6 mm long ..... 13. *L. scabrior*

11′. Panicle ovoid, larger, (2–)9–25(–30) cm long, the base usually completely exserted; upper surface of blades glabrous, or variously pubescent; ligules mostly less than 3.5 mm long.

12. Panicle branches reflexed or widely spreading; sheaths puberulent or glabrous; blades mostly 7–14 cm long, 1.0–2.2 cm wide ..... 5. *L. ligulata*

12′. Panicle branches ascending to spreading; sheaths papillose-hispid or pubescent; blades mostly 9–19 cm long, 1.2–3.4 cm wide ..... 15a. *L. sorghoidea* var. *sorghoidea*

10′. Ligule of upper leaves not readily visible, but if evident, mostly less than 1.5 mm long.

13. Blades glabrous on both surfaces, sometimes with a few small scattered hairs at the base of the upper and/or upper and lower surfaces ..... 2b. *L. divaricata* var. *austroamericana*

14. Blades linear to narrowly lanceolate, mostly less than 2 cm wide.

15. Panicle bearing few spikelets, the lower panicle branches reflexed or widely spreading; pedicels sharply divergent at maturity; culms zigzag ..... 2a. *L. divaricata* var. *divaricata*

15′. Panicle various, but the lower panicle branches mostly not reflexed; culms straight or zigzag.

16. Spikelets 4.0–5.0 mm long.

17. Base of the panicle included in the sheath; pedicels and panicle branches short ..... 2c. *L. divaricata* var. *leptostachya*

17′. Base of the panicle usually exserted; pedicels slender, widely spreading, somewhat flexuous ..... 7. *L. nigra*

16′. Spikelets 3.4–4.1(–4.3) mm long.

18. Blades 0.3–0.7 cm wide; Jamaican endemic ..... 4. *L. harrisii*

18′. Blades 0.6–1.8(–3.0) cm wide; South America ..... 2b. *L. divaricata* var. *austroamericana*

14′. Blades ovate to broadly lanceolate, mostly more than 2 cm wide.

19. Main inflorescence branches sparsely branched, bearing few, large spikelets (3.6–)4.0–5.0(–5.3) cm long.

20. Pedicels short, appressed; blades (1.3–)1.7–4.0(–4.5) cm wide, with a short, densely puberulent pseudopetiole 1–3 mm long ..... 14. *L. sloanei*
20′. Pedicels longer, widely spreading; blades (0.3–)0.6–1.8(–2.6) cm wide, without the short, characteristic pseudopetiole ..... 7. *L. nigra*

19′. Main inflorescence branches highly branched, bearing numerous, smaller spikelets (2.6–)2.8–4.1 cm long.
21. Spikelets globose, the base of the fertile lemma usually with a distinct shelf from which a sterile projection often arises; blades of the main culms ovate to ovate-lanceolate; spikelets densely arranged ..... 12a. *L. ruscifolia* var. *ruscifolia*
21′. Spikelets not globose, more elongated, the base of the fertile lemma without a shelf; blades of the main culms lanceolate, spikelets less densely arranged ..... *L. sorghoidea* var. *patentiflora*

13′. Blades with some pubescence on at least one surface.
22. Blades small, relatively short and broad, ovate, 2–7(–9.5) cm long, (0.5–)0.8–2.8 cm wide, densely arranged on the branches.
23. Upper blade surface hispid, velutinous, or pilose; panicle branches densely pilose ..... 12b. *L. ruscifolia* var. *velutina*
23′. Upper blade surface glabrous to puberulent; panicle branches usually scabrid, puberulent, or with a short pubescence, only rarely pilose.
24. Culms papillose-pubescent or papillose-puberulent throughout; panicle branches reflexed; spikelets 4.0–4.8 mm long, obovate ..... 11a. *L. rugelii* var. *rugelii*
24′. Culms glabrous or with a line of puberulence, not papillose-puberulent throughout; panicle branches ascending to spreading; spikelets 3.6–4.2 mm long, globose ..... 11b. *L. rugelii* var. *pohlii*

22′. Blades larger, linear-lanceolate to ovate, (5–)6–25(–35) cm long, (0.3–)0.6–4.4(–5.6) cm wide, relatively widely separated on the branches.
25. Spikelets (3.6–)4.0–5.0 mm long; panicle rather open with few spikelets, the pedicels widely spreading ..... 7. *L. nigra*
25′. Spikelets (2.6–)2.8–4.1 mm long; panicle much denser, the pedicels not as widely spreading.
26. Spikelets obovate; leaves typically with the following combinations of pubescence, the upper blade surface puberulent, the lower surface velutinous, the collar densely hispid, and the sheath papillose-hispid, sometimes the foliage only puberulent; blades usually linear-lanceolate to lanceolate, typically proportionally longer and narrower; inflorescences open, generally larger, (5–)9–25(–35) cm long; spikelets (3.0–)3.4–4.1(–4.3) mm long ..... 15a. *L. sorghoidea* var. *sorghoidea*
26′. Spikelets usually globose; leaves only rarely with the above combination of pubescence, glabrous to hispid or villous; blades usually lanceolate-ovate to ovate, proportionally shorter and broader; inflorescences dense, generally smaller, (2–)4–16(–22) cm long; spikelets (2.6–)2.8–3.8(–4.0) mm long ..... 12a. *L. ruscifolia* var. *ruscifolia*

1. **Lasiacis anomala** Hitchc., J. Wash. Acad. Sci. 9: 37. 1919. TYPE: Trinidad, Fort George Road, Port of Spain, edge of jungle, high climbing, with strong

central cane, the branches not fascicled, main culm thick as pencil, 27 Nov. 1912, *Hitchcock 9977* (=Amer. Grass Natl. Herb. No. 595) (US, holotype; F, GH, MO, NY, P, US, isotypes).

Panicum latifolium var. *tomentellum* Doell in Mart., Fl. Bras. 2(2): 207. 1877. TYPE: Brazil, Ceará, *Gardner 1894* (K, lectotype; NY, P, US, isolectotypes).

Perennial; culms caespitose, 0.4–5.0 m long, lignified, erect and arching, commonly rather weak and supported in erect position by surrounding vegetation, small culms of young plants occasionally procumbent and then rooting at the nodes; internodes of main culms 3–9 mm thick, hollow, glabrous, those of the ultimate branches often with a dense to sparse line of puberulence; nodes glabrous; primary branches usually 1 per node, secondary and tertiary branches 1 per node to fascicled; sheaths usually puberulent, sometimes villous or hispid with hairs to 1.5 mm long, often becoming glabrate on the upper sheaths, rarely all sheaths glabrous, the upper margin and throat ciliate, the auricular hairs inconspicuous to 2.5 mm long; collar typically densely puberulent to hispid with hairs up to 1.2 mm long; ligule membranous, 0.3–0.8(–1.8) mm long; blades (2.5–)5–12(–15) cm long, 0.8–3.0(–4.0) cm wide, ovate to narrowly elliptic-lanceolate, the upper surface puberulent or pubescent, rarely glabrous, the lower surface usually densely, softly puberulent, occasionally hispid or glabrous, the apex abruptly acute to gradually acuminate, the base asymmetrical, ciliate, somewhat clasping, the margin scabrid; lower leaves of secondary and tertiary branches usually with more pronounced pubescence, the upper leaves of the main branch often becoming glabrate; panicles 2–15 cm long, the longest branch 1–4 cm long, with the spikelets rather evenly and compactly arranged on the branches, the branches ascending to widely spreading and reflexed, the lower ones well separated, minutely puberulent and scabrous, the pulvini puberulent to glabrous; spikelets (2.8–)3.1–3.5(–3.8) mm long, globose; first glume (1.0–)1.2–1.8 mm long, 7-nerved; second glume (2.0–)2.3–2.7 mm long, 9-nerved; first sterile lemma 9-nerved, without a sterile palea or a flower, subequal in length to the fertile floret; second sterile lemma 9-nerved, with a sterile palea ½ to ¾ the length of the fertile floret, usually without, sometimes with a staminate flower; fertile floret 2.6–2.9 mm long, 1.6–1.7 mm wide, blackish brown, the anthers 1.6–1.7 mm long, white, the stigma white; caryopsis 2.0–2.1 mm long, 1.5–1.6 mm wide, light brown; chromosome number $n = 18$.

Ecology: *Lasiacis anomala* typically inhabits savana areas or the drier tropical forests at elevations from sea level to 800 m. It occurs commonly along forest edges, in gallery forests, in brush of secondary forests, and in clumps of trees in savannas. Collections with spikelets have been made from late April to December.

Distribution: This species is found in north-central South America including eastern Colombia, Venezuela, Guyana, Surinam, and northern Brazil. It also occurs on the islands of St. Vincent, Barbados, Trinidad, and Margarita.

Lasiacis anomala is unique in having an extra bract (sterile lemma) in the spikelet and identification, therefore, causes no problem. Hitchcock (1919) discussed this species in detail. He considered it to be closely related to *L.*

ruscifolia, differing essentially only in the presence of the extra sterile lemma. This character plus the distinctive geographical range, which excludes *L. ruscifolia*, were cited by him as reasons for accepting this taxon at the specific level. The present study confirms this conclusion. Field studies of many populations in Trinidad and Venezuela showed that these plants occur in pure populations. Spikelets in all plants in each population examined had an extra sterile lemma.

As Hitchcock (1919) noted, the presence of a second sterile lemma is contrary to the typical spikelet structure in the tribe Paniceae. Although this is a very striking morphological feature, one might hypothesize that it could be the result of a very small genetic difference, possibly a one gene difference. However, hybridization with *L. ruscifolia* (unpubl.) indicated that the two taxa are probably reproductively isolated, and its seems likely that more than one gene is responsible for the spikelet differences between the two taxa. Although the sterility barrier was not complete, there was a significant reduction in the fertility of the hybrids. This, plus the morphological difference and distinct geographical distribution of these taxa, is evidence that they should be maintained at the specific level.

Plants of *L. anomala* are in most respects similar to *L. ruscifolia*, as noted by Hitchcock. However, the inflorescences are smaller and more compact, the leaves are consistently smaller and less variable in pubescence, and the plants are generally less robust but more straggling and scandent than in *L. ruscifolia*.

BARBADOS. Hopewell, *Johnson 1246* (NY).

BRAZIL. AMAZONAS: Rio Branco, *Kuhlmann 3358* (US). BAHIA: Serra do Curral Feio, *Harley 16991* (MO). *16913* (MO). CEARÁ: Baturité, *Eugenie 284* (RB, US). Without definite locality, *Gardner 1884* (NY, US), *1894* (P), *1889* (US). Baturité to Guaramirango, *Swallen 4419* (RB, US). Campo Grande, *Swallen 4516* (US), *4587* (RB, US). MARANHÃO: Caxias to Barra do Gorda, *Swallen 3554* (US).

COLOMBIA. VICHADA: La Venturosa, Río Meta, *Cuatrecasas 4191* (F, US).

GUYANA. Takuta River, *Smith 3131* (F, GH, MO, NY, US).

SURINAM. Ebbatop, *Amshoff 1563* (NY). Wilhelmina Gebergte, *Irwin et al. 54540* (MO, NY, UC, US), *55331* (MO, NY, UC, US), *55696* (MO, NY, UC, US); *Maguire et al. 54204* (MO, NY, UC, US); *Schulz 10461* (IJ). Near Wonotobo, *Stahel & Gonggrijp 2854* (US).

TRINIDAD. Vic. of Brighton, *Britton 2905* (NY, US). Moruga, *Broadway 2504* (F, US). Mayaro, *Broadway 2627* (F, ISC, M, US). Chaguaramas, *Broadway 6739* (MO, US). Monos, *Broadway 7447* (US). Point Gourde, *Broadway 8081* (A, US), *8083* (MO, US). Chaguaramas, *Broadway s.n.* (US). Look Out Hill, *Broadway s.n.* (F, GH, MO, NY, US). Vic. of Piarco, *Davidse 2522* (ISC, MO), *2523* (ISC, MO). Irois Bay, *Davidse 2580* (ISC, MO). Vic. of Piarco, *Davidse 2591* (ISC, MO), *2592* (ISC, MO). Port of Spain, *Hitchcock A.G.N.H. 595* (F, GH, MO, NY, US), *10001* (F, US). St. Joseph, *Hitchcock 10021* (US). Chacachacare, *Hitchcock 10063* (US). San Fernando, *Hitchcock 10117* (US). Vic. of Cedros, *Hitchcock 10136* (GH, US). Erin Savanna, *Soderstrom 1126* (NY, UC, US). St. George, Morne Catherine Rd., *Webster & Miller 9943* (US).

VENEZUELA. AMAZONAS: Bords de l'Orénoque, *Chaffanjon 190* (P). 12.5 km N of Puerto Ayacucho, *Davidse 2784* (ISC), *2786* (ISC, MO). 5 km N of Sanariapo, *Maguire et al. 36170* (NY, US, VEN). Maypures, *Muer 3636* (P). 10–30 km ESE of Puerto Ayacucho, *Steyermark et al. 113905* (MO). ANZOÁTEGUI: Pariaguán, *Pittier 14535* (US, VEN), *14538* (F, US, VEN). El Guácimo, *Pittier 15053* (US). ARAGUA: Cata, *Cardenas 499* (MO, MY). Rancho Grande, *Montaldo & Ramia 3310* (MY). Maracay, *Montaldo 3532* (NY). Near Ocumare, *Pittier 14162* (NY, US). BOLÍVAR: 21 km E of Río Caura, *Davidse 4469* (MO). 13 km ESE of Upata, *Davidse et al. 4617* (MO). 18 km N of Upata, *Gentry & Berry 14923* (MO). 1 km NW of Upata, *Steyermark 57686* (F, NY, US). 2 km SE of Los Patos, *Steyer-*

mark 86992 (VEN). E of Miamo, *Steyermark 88215* (NY, US). Hato El Pillar, *Trujillo 2278* (MY). Cerro Bolívar, *Wurdack 34398* (NY, US, VEN). CARABOBO: Cortado Yuma, *Box 3913* (MO, MY, VEN). Vic. of Valencia, *Pittier 9016* (GH, NY, US, VEN), *9062* (GH, NY, US, VEN). Lago de Valencia, *Trujillo 3815* (MY). FALCÓN: Cerro Santa Ana, Paraguana, *Curran & Haman 699* (VEN); *Lasser & Aristeguieta 3394* (VEN). GUÁRICO: Vic. of Calabazo, Estación Biológia, *Aristeguieta 4335* (VEN), *5623* (NY, VEN); *Castellanos 12* (VEN); *Davidse 2916* (ISC, MO). 16 km S of Calabozo, *Davidse 2970* (ISC, MO). 26 km S of Calabozo, *Davidse 2983* (ISC, MO). 5.5 km W of Guayabol, *Davidse 3001* (ISC, MO). 46 km NW of Calabozo, *Davidse 3007* (ISC, MO). 10 km SSE of Calabozo, *Davidse 3690* (MO). 54 km N of San Fernando de Apure, *Davidse et al. 3968* (MO). 80 km S of Las Mercedes, *Davidse 4272* (MO). Vic. of Calabozo, *Trujillo 8638* (MO, NY). LARA: Sabanas de Cujicito, *Saer 533* (F, VEN). MONAGAS: Santa Bárbara Camp, *Maguire et al. 27275* (NY, US, VEN). NUEVA ESPARTA: Isla Margarita, *Johnston 196* (GH); *Miller & Johnston 184* (F, GH, MO, NY, US). YARACUY: 5 km S de Bella Vista, *Agostini et al. 1808* (MO). Between Campo Elías and Alerachiche, *Aristeguieta & Foldats 1330* (VEN).

2a. **Lasiacis divaricata** (L.) Hitchc. var. **divaricata**, Contr. U.S. Natl. Herb. 15: 16. 1910.

Panicum divaricatum L., Syst. Nat., ed. 10. 2: 871. 1759. TYPE: Jamaica, *Browne s.n.* (LINN, holotype, microfiche of the Linnaean Herbarium, sheet 80.65, inscribed Br.).

P. bambusoides Desv. in Hamilt., Prodr. Pl. Ind. Occ. 10. 1825. TYPE: Puerto Rico, "habitat in Am. Equinoxi" (P, holotype, photograph US).

P. chauvinii Steud., Syn. Pl. Glum. 1: 68. 1854. TYPE: Guadeloupe, *Duchassaing s.n.* (P, holotype).

P. divaricatum var. *stenostachyum* Griseb., Fl. Brit. W. Ind. 551. 1864. TYPE: Jamaica, *March 20* (GOET, holotype, fragments US).

P. divaricatum var. *glabrum* Kuntze, Rev. Gen. Pl. 2: 784. 1891. TYPE: not indicated, not seen.

Perennial; culms erect, caespitose, (0.5–)1–5(–7) m long, lignified but rather weak, usually strongly arching and supported in brush, often bending to the ground when unsupported, the upper portion of the main culm and large primary and secondary branches usually zigzag; branches solitary or fascicled at the nodes; internodes hollow, 5–9 mm thick, glabrous or with a line of puberulence on one side, rarely puberulent throughout or at the apex only; nodes glabrous; sheaths usually glabrous, less frequently puberulent, especially on the internerves, the overlapping margin and throat ciliate with hairs to 3.0 mm long, the auricular hairs 0.3–2.0(–3.0) mm long; collar usually sparsely puberulent, rarely densely pubescent with hairs to 0.7 mm long or completely glabrous; ligule membranous, inconspicuous, and usually not directly visible, 0.2–0.6(–1.2) mm long, usually ciliolate with hairs 0.1–0.3(–0.5) mm long, occasionally glabrous; blades (3–)5–12(–16) cm long, (0.3–)0.6–1.4(–2.0) cm wide, linear-lanceolate or lanceolate, the upper surface glabrous except for some scabridity or puberulence along the lower part of the midrib, the lower surface glabrous, rarely minutely puberulent, especially at the base, the base asymmetrical, the margin scabrid, the apex acuminate; lower blades on the culms often deciduous, leaving the sheaths; panicles 2–12(–20) cm long, the longest branch 2–8(–12) cm long, bearing few, widely spaced spikelets, the branches, especially the lower, reflexed, the upper branches widely spreading, scabrid, or the lower portions puberulent, the pedicels widely divergent from the panicle branches, the lower pulvini usually puberulent, occasionally glabrous; spikelets (3.5–)3.7–4.3(–4.5) mm long, obovate; first glume (1.2–)1.4–2.0(–2.5) mm long, 7–11(–13)-nerved; second glume

9–11-nerved; sterile floret without a flower, the lemma 9–13-nerved, the palea subequal to ½ the length of the fertile floret; fertile floret 3.4–4.0 mm long, 1.9–2.4 mm wide, whitish to brown at maturity, the anthers ca. 2.0 mm long, white, the stigmas purple; caryopsis 2.2–2.4 mm long, 1.7–1.9 mm wide, whitish; chromosome number $n = 18$.

Ecology: *Lasiacis divaricata* var. *divaricata* occupies a wide range of habitats. In Florida it is usually found in hammocks, but it has also been occasionally collected in pinelands. In the West Indies the plants are found from the xerophytic coastal thickets and *Acacia* shrub communities to the more mesophytic pine forests of broadleaf forests. In Central America and Mexico it is most common along brushy borders of lowland broad leaf forests, although it also occurs in the pine forest. Plants have been collected primarily below 1,000 m, only rarely above this in Mexico. Spikelet-bearing plants have been collected throughout the year, but the majority have been collected from June to early March.

Distribution: *Lasiacis divaricata* var. *divaricata* is essentially a Caribbean species. It extends from the southern tip of Florida throughout most of the West Indies, becoming rare in Trinidad and Venezuela. It is also known from Mexico to Panama.

I have followed Chase & Niles (1962) in assigning *P. divaricatum* var. *glabrum* to synonymy under *L. divaricata* var. *divaricata*. I have not seen the specimens upon which the names were based, but since these were from the Caribbean area and were described as having glabrous leaves, this seems a reasonable disposition of the name.

Lasiacis divaricata var. *divaricata* is recognized by its usually glabrous (only rarely minutely puberulent), narrowly lanceolate, rather firm, glossy blades, short ligules that are usually not visible without opening the sheath, and panicles with reflexed branches bearing a few obovate spikelets.

Hitchcock (1920, 1936) and Swallen (1943, 1955a) have stressed the glabrous nature of *L. divaricata*, and for this reason, all small-leaved, glabrous plants from South America have usually been considered to belong to this variety. Little attention had been paid to inflorescence, spikelet, and ligule characters, in all of which these South American plants traditionally assigned to *L. divaricata* differ from var. *divaricata* as recognized by me. For this reason, those South American plants are recognized as a new variety (var. *austroamericana*), thus limiting var. *divaricata* to the West Indies and much of the immediate adjoining Caribbean continental area.

The majority of specimens from Central America, Mexico, Cuba, and occasional specimens from throughout the remaining areas of its range have distinctly puberulent sheaths, rather than the glabrous sheaths ascribed to this taxon by Hitchcock (1920, 1936). Some specimens from Chiapas (*Beetle M-3902*) and Belize (*Croat 23649, 23707*; *Dwyer 11155*) have papillose-puberulent internodes and in this respect resemble *L. divaricata* var. *leptostachya*.

Through many of the Lesser Antilles extending from Saba to Grenada, there occur plants with ligules primarily 0.6–1.0 mm long. These appear somewhat different from most plants of var. *divaricata* because the ligules can usually be

easily seen without moving the sheath back. The distinction seems hardly great enough to warrant varietal status. If this was desired, however, it should be noted that the type of *Panicum chauvinii* falls within this morphological group.

Common names: Hitchcock (1936) reports that this species is known as pito de bejuco in Cuba. Cuba: Santa Clara, tibisi, *Luna 206*. Bahamas: Conception Island, wild cane, *Britton & Millspaugh 60633*.

BAHAMA ISLANDS. ACKLINS ISLAND: *Brace 4305* (F, NY, US). ANDROS ISLAND: Deep Creek, *Brace 5108* (F, NY). Conch Creek, *Brace 6786* (F, NY). Deep Creek, *Northrop & Northrop 723* (F); *Small & Carter 8586* (F, NY, P, US). ANGUILLA ISLAND: Salt Key Bank, *Wilson 8051* (F, NY). CAT ISLAND: Wilson Bay, *Byrne 133* (A, WIS), *227* (WIS), *s.n.* (A). CONCEPTION ISLAND: *Britton & Millspaugh 6033* (F, NY). CROOKED ISLAND: Marine Vied Road, *Brace 4617* (F, NY). *Hitchcock s.n.* (MO). ELEUTHERA: Glass Window to Gregory Town, *Britton & Millspaugh 5405* (F, NY). Harbour Isle, *Britton 6403* (F, NY). *Rothrock 584* (F). GREAT ABACO ISLAND: Green Turtle Cay, *Brace 1509* (F, NY). Cherokee, *Brace 1908* (F). Green Turtle Cay, *Correll & Correll 47652* (MO). Near Treasure Cay, *Gillis 6134* (A). Lubbers Quarters, *Gillis 7338* (A). Wilson City, *Proctor 30706* (IJ). GREAT BAHAMA ISLAND: Barnett's Peak, *Britton & Millspaugh 2630* (F, NY). GREAT INAGUA: NW Point, *Dunbar 233* (A). LITTLE INAGUA: Whiteland, *Nash & Taylor 1240* (NY). LITTLE SAN SALVADOR: *Britton & Millspaugh 5696* (F, NY). LONG ISLAND: *Brace 4230* (F, NY, US). South Clarence Town, *Hill 2289* (MO). NEW PROVIDENCE: Lake Cunningham, *Britton & Brace 640* (F, NY). *Cooper s.n.* (NY). Ca. 1 mi S of Foxhill, *Correll & Popenoe 40321* (MO). Nassau, *Degener 18789* (GH, NY); *Hitchcock s.n.* (F, US); *Meriläinen & Roe 36* (WIS). NORTH CAICOS: Vic. of Kew, *Millspaugh & Millspaugh 9132* (F, NY); *Proctor 9032* (IJ). ROSE ISLAND: Scrub Island, *Britton & Millspaugh 2130* (F, NY, US). RUM CAY: Sclater's Tract, *Brace 3978* (F, NY). SOUTH BIMINI: *Howard & Howard 10069* (GH, NY). WATLING'S ISLAND: *Wilson 7309* (F, GH, NY).

BELIZE. BELIZE: Vic. of Maskall River, *Croat 23924* (MO). Vic. of San José Mayan Indian Village, *Croat 24420* (MO). Gracie Rock, *Dwyer 10971* (MO). 1.5 mi W of Maskall, *O'Neill 8457* (F, GH, UC). Near Manatee Lagoon, *Peck 93* (GH). Rd. to Sibun River, *Rose Innes 58* (IJ, ISC). CAYO: Vic. of Millionario, *Croat 23649* (MO), *23707* (MO). Vaca, *Gentle 2332* (F, GH, US). El Cayo, *Lundell 6145* (F, GH, NY, US); *Lundell 6430* (F, GH, NY, US). COROZAL: Port Sal, *Gentle 103* (F); *Lundell 4904* (NY). ORANGE WALK: Mi 54, Northern Hwy., *Dwyer & Liesner 12209* (MO). Hillbank Camp, *Pelley 33* (F). STANN CREEK: 5 mi S of Lynam Agric. College, *Crankshaw 16* (MO). Carib Reserve, *Gentle 3001* (GH, US), *7975* (F, IJ, NY, UC, US). Broken Ridge, *Gentle 8215* (F, IJ, NY, UC, US). Cohune Ridge, *Gentle 8523* (F, IJ, UC, US). Stann Creek Valley, *Gentle 9089* (US). Middlesex, *Schipp 332* (F, GH, MO, NY, UC, US). Ca. 5 mi S of Lynam Agric. College, *Spellman 1598* (MO). Silkgrass Creek Reserve, *Stevenson 171* (F). TOLEDO: Columbia Forest Station, *Dwyer 9957* (MO). San José, *Dwyer 11155* (MO). Monkey River, *Gentle 3657* (F, GH, MO, NY, US). Near Jacinto Creek, *Gentle 5572* (F, IJ, US). Chavarrias Rd., *Gentle 6278* (IJ, US). Between Machaca and Camp Z, *Gentle 6931* (F, IJ, NY, UC, US). El Dorado Rd., *Gentle 6963* (F, IJ, NY, UC, US). Near Colombia, *Gentle 7098* (US). Near San Antonio, *Gentle 7785* (IJ, US). DISTRICT UNKNOWN: 4 mi W of Salt Marsh, *O'Neill 8492* (F, GH, UC).

CAYMAN ISLANDS. CAYMAN BRAC: *Millspaugh 1172* (F), *1226* (F, US); *Proctor 28962* (IJ). GRAND CAYMAN: *Brandt 1694* (IJ), *2031* (IJ). Governor's Island, *Kings GC166* (MO, NY). Georgetown, *Lewis s.n.* (IJ). LITTLE CAYMAN: *Kings LC94* (MO, NY). SWAN ISLANDS: *Nelson 87* (GH, US); *Proctor 32561* (IJ).

COSTA RICA. ALAJUELA: Vic. of Los Chiles, *Holm & Iltis 728* (A, NY). LIMÓN: Limón area, *Pohl & Calderón 9991* (ISC).

CUBA. CAMAGÜEY: Vic. of La Gloria, *Shafer 23* (F, NY). Cayo Camagüey, *Shafer 2571* (F, GH, NY, P, US). Cayo Coco, *Shafer 2720* (F, GH, NY, US). HABANA: Cerca Managua, *Baker & Wilson 304* (F, NY, US). Anafe, *Ekman 1020* (NY). Cerro de Esperón, *Killip 13509* (US). Vic. of Cojimar, *Killip 13808* (US); *León 1970* (US), *1971* (US). Near Camp Colombia, *León 767* (ISC, US). Vic. Jamaica, *León 2602* (GH, US). Madruga, *León 8945* (GH, NY). Vic. of Jamaica, *León 13658* (GH, US). Almendares River, *Shafer 12464* (US). ISLA DE PINOS: Sierra de los Caballos, *Britton & Wilson 15134* (F, NY). Nueva Gerona, *Curtiss s.n.* (NY). Pedernales Point, *Millspaugh 1422* (F, US). Nueva Gerona,

Palmer & Riley 1001 (NY, US). San Juan, *Roig & Cremata 1779* (NY). LAS VILLAS: Cayamas, *Baker 2501* (F, NY), *4611* (US). Trinidad Mts., *Brues s.n.* (GH, NY). Cienfuegos, *Brues s.n.* (GH); *Combs 148* (F, GH, ISC, MO, NY). Caibarién, *Fernando 349* (GH, US). Sierra de San Juan, *Hodge & Howard 4493* (A). Río San Juan, *Howard et al. 384* (A, ISC, NY, UC, US). Cienfuegos, *Jack 4380* (A, NY, UC). Near Sancti Spiritus, *León 904* (US); *Linden 2* (GH). Loma de Banao, *Luna 26* (NY). Sierra de San Juan, *Morton 4123* (US), *4143* (UC, US). Trinidad Mts., *Morton 4210* (UC, US). Sierra de San Juan, *Morton 4528* (US). Trinidad Mts., *Smith et al. 3269* (F, MO, UC, US). *Webster et al. 206* (A); *Wood & Atchison 7463* (US). MANTANZAS: Mantanzas, *Britton & Wilson 241* (NY). San Miguel de los Baños, *Killip 13919* (US). Near Cauasí, *León 13118* (GH, US). ORIENTE: Guatanomo, *Britton 2106* (NY, US). Santiago, *Clemente 2879* (GH, IJ). Near Playa de Juraguá, *Clemente 7444* (GH, IJ). Near Manatí, *Garteiz 5685* (NY, US). Guatánomo, *Hioram 2198* (NY). Guaro, *Hitchcock 23398A* (US). Sierra de Nipe, *León 20350* (GH). Canamova, *León 21097* (GH). Central Palma, *Linder 5* (GH). Santiago, *Millspaugh 1015* (F, US). Sierra de Nipe, *Morton & Acuna 2914* (GH, MO, NY, US), *3218* (MO, US). Sierra Maestra, *Morton & Acuna 3433* (F, GH, NY, US). Sierra de Nipe, *Morton et al. 8753* (US). Puntón de Cuerro, *Morton & Alain 8879* (US). Vic. of Baracoa, *Pollard et al. 76* (F, GH, MO, NY, UC, US). S of Holguin, *Shafer 1375* (NY, US). Sierra de Nipe, *Shafer 3017* (F, NY, US). Río Yamuri, *Shafer 7827* (NY, US). Farallon de la Perla, *Shafer 8751* (NY, US). Baracoa, *León & Victorin 17336* (GH, US). Santiago, *Taylor 324* (NY); *Underwood & Earle 1642* (NY). 8 km S of Moa, *Webster 3822* (GH, US). 3 km N of El Morro, *Webster 4058* (GH, US). 5 km S of San Pablo de Yao, *Webster 4076* (GH, US). PINAR DEL RÍO: Cajálbana, *Alain 1671* (GH, IJ). Vic. of Pinar del Río, *Britton 10042* (NY). San Diego de los Baños, *León 4662* (US). Rosario Mts., *León 12776* (GH). El Rosario, *León 14118* (US). Vic. of Mendoza, *Shafer 10597* (F, GH, MO, NY). Sierra Mendoza, *Shafer 11149* (F, NY, US). Arroyo del Sumidero, *Shafer & León 13564* (F, NY). Sierra de Anafe, *Wilson 11363* (F, NY, US).

DOMINICAN REPUBLIC. BARAHONA: Barahona, *Abbott 1542* (GH, US). Polo, *Abbott 1840* (GH, US), *1876* (GH, US). Maniel Viejo, *Abbott 1914* (F, GH, MO, US). 12 km NNE of Polo, *Davidse 2721* (ISC, MO). Near Rincón, *Fuertes 1276* (GOET, M), *1476* (GH, MO, US). DISTRITO NACIONAL: Vic. of Ciudad Trujillo, *Allard 13463* (A, US), *13464* (A, MO, NY, US), *13573* (US), *14126* (NY, US), *15750* (US), *18929* (US). Km 32 Santiago-Santo Domingo Hwy., *Davidse 2619* (ISC, MO). Santo Domingo, *Rose et al. 4142* (US). EL SEIBO: E of Jovero, *Abbott 2859* (GH, NY, US). LA VEGA: Cotuy, *Abbott 737A* (IJ, US). Vic. of Piedra Blanca, *Allard 13613* (US). Vic. of Jarabacoa, *Augusto 1015* (NY). 17–18 km N of Jarabacoa, *Davidse 2633* (ISC, MO), *2641* (ISC, MO). Near Hotel Montaña, *Gould & Jiménez 14102* (MO). Vic. of Jarabacoa, *Jiménez 5937* (NY). La Vega to Jarabacoa, *Liogier 12410* (NY). 4 mi S of La Vega, *Liogier 15871* (NY). MACORIS: 23 km W of San Pedro de Macoris, *Howard & Howard 9503* (GH, NY, US); *Rose et al. 4159* (US), *4441* (US). Consuelo, *Taylor 242* (NY). PEDERNALES: 10 mi NE of Cabo Rojo, *Liogier 16944* (NY). PUERTO PLATA: 9 km SW of Sabaneto de Yásica, *Davidse 2674* (ISC, MO). Yaroa, *Jiménez 2764* (US). Loma del Puerto, *Liogier 15917* (NY). SAMANÁ: Vic. of Sánchez, *Abbott 171* (US), *179* (IJ, US). Vic. of Laguna, *Abbott 297* (IJ, US). Vic. of Samaná, *Abbott 506* (IJ, US), *1523* (GH, US). Vic. of Sánchez, *Abbott 1527* (F, GH, US); *Taylor 2* (F, NY). SAN JUAN: El Cerado, *Howard & Howard 8672* (GH, MO, NY, P). SANTIAGO: Navarette, *Abbott 1084* (US). Pico Diego de Ocampo, *Jiménez 1464* (US). Jaiqui to Picado, *Liogier 17049* (NY).

GUATEMALA. ALTA VERAPAZ: Near Finca Sepacnite, *Cook & Griggs 138* (US). Chamá, *Johnson 177* (US). Trece Aguas, *Lewton 286* (US). Cubilquitz, *Standley 70615* (F, US); *von Tuerckheim 7696* (US). ESCUINTLA: Near Escuintla, *Standley 63909* (F). IZABAL: Los Amates, *Blake 7721* (US), *7759* (US). Ca. 7 mi S of Puerto Barrios, *Croat 41779* (MO). Near Puerto Barrios, *Standley 24888* (US), *24889* (F), *25065* (F), *72832* (F, US), *72889* (F). Cerro San Gil, *Steyermark 41967* (F, US). PETÉN: La Libertad, *Aguilar 19* (GH, MO, US). Dolores area, *Contreras 2448* (US), *2591* (US), *2732* (US), *2921* (US), *3043* (GH, IJ, US), *3162* (US). Lacandón, *Contreras 3298* (GH, US). Lake Yaxha, *Dwyer 11239* (MO). La Libertad, *Lundell 1587* (NY, US). Monte Santa Teresa, *Lundell 2734* (US). La Libertad, *Lundell 3548* (US), *4882* (US). Entre Sta. Elena y San Francisco, *Molina 15628* (US). QUEZALTENANGO: El Palmar, *Kellerman 6264* (US). Above Mujuliá, *Standley 85472* (F, US). SANTA ROSA: Near Cuilapa, *Standley 77697* (F).

HAITI. GONAVE ISLAND: Vic. of Anse Galette, *Leonard 3071* (US), *3072* (F, GH, US), *3074* (IJ), *3081* (NY, US). Vic. of Etroite, *Leonard 3293* (US). Vic. of Pikmi, *Leonard 5111* (GH, IJ, US), *5211* (IJ, NY, US). L'ARTIBONITE: Hinche to Papaye, *Anderson 1322* (MO,

UC, US). Vic. of St. Marc, *Leonard 2907* (GH, IJ, NY, US). Vic. of Ennery, *Leonard 8997* (US), *9007* (P, US). L'OUEST: Pétionville, *Ekman 2334* (A, US). Thomazeau, *Ekman 8559* (A, US). Vic. of Port-au-Prince, *Hitchock 19888* (US). Vic. of Mission, *Leonard 3758* (GH, US), *3785* (IJ, US). Pétionville, *Leonard 4848* (GH, IJ, US), *4970* (US). Vic. of Port-au-Prince, *Leonard 5270* (GH, NY, US). NORD: Near Port Margot, *Bartlett 17404* (A, US). Milot, *Buck 471* (GH). Vic. of Marmelade, *Buck 1090* (GH, IJ). La Victoria, *Holdrige 1737* (NY, US). Vic. of St. Michel de l'Atalaye, *Leonard 7011* (IJ, NY, US), *7292* (UC, US), *7605* (F, GH, US), *8052* (MO, US). Vic. of Marmelade, *Leonard 8249* (US). Port de Paix, *Leonard & Leonard 11116* (GH, P, US). Near Port Margot, *Nash 362* (F, NY). NORD-OUEST: Tortue Island, *Leonard & Leonard 11235* (IJ, MO, UC, US), *11352* (US), *11688* (US), *11692* (US), *12539* (NY, US), *15297* (US). SUD: Cayaba to Moron, *Bartlett 17312* (A, UC, US). N of Morne Jeffrod, *Bartlett 17558* (US). Morne Quinille, *Christ 1898* (US). Grande Cayenite, *Eyerdam 326* (GH, MO, P, US).

HONDURAS. ATLANTIDA: Isla de Roatán, *Barkley & Barkley 39669* (MO). 28 km NE of El Progreso, *Davidse & Pohl 2174* (ISC, MO). 33 km SE of Tela, *Davidse & Pohl 2189* (ISC, MO). 17 km SSE of La Ceiba, *Davidse & Pohl 2196* (ISC, MO). Isla Roatán, *Harmon & Dwyer 3962* (MO). Between Saladite and San Francisco, *Molina 20845* (F, NY). Vic. of San Alejo, *Standley 7712* (F). Near Tela, *Standley 53092* (A, F, US), *54282* (A, F, US), *54545* (A, F, US). San Juan Carib Village, *Yuncker 4811* (F, MO, UC). COMAYAGUA: San José de Comayagua, *Davidse & Pohl 2226* (ISC, MO). Near Siguatepeque, *Yuncker et al. 5651* (F, GH, MO, US). Above El Achote, *Yuncker et al. 6012* (F, GH, NY, US). COPÁN: 11 mi S of Chiquila, *Croat 42537* (MO). Entre El Portillo y San Juan Opoa, *Molina 12888* (US). OLANCHO: 3 km SW of Dulce Nombre de Culmí, *Davidse & Pohl 2440* (ISC, MO). Near El Ploma, *Molina 13291* (US).

JAMAICA. CLARENDON: Portland Ridge, *Barry s.n.* (IJ). Lower Clarendon, *Harris 12725* (F, GH, MO, NY, US), *12740* (F, GH, MO, NY, US). Peckham Woods, *Harris 12768* (MO). Portland Ridge, *Lewis s.n.* (IJ). Peckham Woods, *Patrick 118* (IJ). Mason River Savanna, *Proctor 16228* (IJ). W slope of Crofts Mtn., *Proctor 29244* (IJ). Portland Point, *Taylor s.n.* (IJ). Portland Ridge, *Webster 5120* (A). MANCHESTER: Vic. of Mandeville, *Britton 966* (NY); *Brown 136* (NY). Southern Manchester, *Harris 12691* (F, GH, MO, NY, US); *Hitchcock 9838* (US). Sommerset Woods, *Howard & Proctor 14899* (A). PORTLAND: Hope Bay, *Adams 5551* (M). Rodney Hall, *Adams 11638* (MO). Navy Island, *Millspaugh 1820* (F). Between Drapers and Frenchman's Cove, *Wedderburn 198* (IJ). ST. ANDREW: Mona, *Barry s.n.* (IJ). Cooper's Hill, *Crosby & Anderson 1099* (F, MO, NY, UC). Castleton, *Harris 11297* (F, GH, IJ, MO, NY, P, US). Bryan's Hill, *Harris 11528* (F, NY, US), *11530* (NY, US). Vic. of Constant Spring, *Hitchcock 9264* (US), *9267* (US), *9268* (US). Ferry Hill, *Stearn 819* (A). Long Mtn., *Webster 4998* (A, IJ). Long Mtn., *Yuncker 17332* (F, MO). ST. ANN: Between Alderton and York Castle, *Anderson & Sternberg 3086* (US). 1.4 mi S of Ocho Rios, *Davidse & Conroy 3274* (ISC, MO). Mt. Diablo, *Hespenheide 967* (GH, MO, US). Edwarton–Moneaque, *Hitchcock 9449* (US). Lydford Post Office, *Howard & Proctor 13492* (A, IJ). Moneaque, *Hunnewell 14112* (GH). Mt. Diablo, *Maxon & Killip 473* (F, GH, P, US); *Ridley 23* (US). ST. CATHERINE: Old Harbour Bay, *Britton & Hollick 1841* (NY). Mt. Diablo, *Hespenheide 1409* (GH, MO, NY, UC, US). Bog Walk to Spanish Town, *Hitchcock 9304* (US). Edwarton to Linstead, *Hitchcock 9420* (US), *9426* (US). Hollymount, *Maxon 10463* (NY, US). Juan de Bolas, *Proctor 7108* (A, IJ, NY). ST. ELIZABETH: Font Hill, *Britton 1510* (NY). Near Malvern, *Dignum 1* (IJ). Near Ipswich, *Harris 12512* (GH, MO, NY, US); *Hitchcock 9628* (US). S of Gutters, *Howard & Proctor 13841* (A, IJ), *14491* (IJ). ST. JAMES: 0.5 mi WNW of Mocho Crossroads, *Hespenheide 1529* (GH). Montego Bay, *Hitchcock 9687* (US). Adelphi, *Powell 5716* (IJ). ST. MARY: Troy, *Harris 12572* (F, GH, MO, NY, US), *12597* (F, GH, MO, NY, US); *Hitchcock 9802* (US). Cabarita Island, *Proctor 7541* (IJ). ST. THOMAS: Windward Road, *Adams 5501* (MO). 2.3 mi E of Eleven Mile Post jct., *Davidse & Conroy 3258* (ISC, MO). 3 mi S of Claremont, *Hitchcock 9519* (US). TRELAWNY: Vic. of Barbecue Bottom, *Patrick 246* (IJ). Windsor Estate, *Patrick 272* (IJ). WESTMORLAND: Glasgow, *Harris 12629* (MO). Savanna La Mar, *Hitchcock 9881* (US). Blauwearie, *Proctor 7315* (IJ), *9315* (IJ). 1.5 mi W of Little London, *Proctor 11207* (IJ).

LEEWARD ISLANDS. ANTIGUA: Sugar Loaf Mtn., *Box 64* (NY, US). Macarthy Valley, *Box 91* (US). *Rose et al. 3392* (GH, NY, US), *3659* (US), *3660* (US). GUADELOUPE: *Duchaissing s.n.* (GOET, US); *Le Gallo 547* (IJ); *Questel 600* (US), *4023* (US); *Stehlé 2607* (US). MARIE GALANTE: Vic. of Pointe de Folle Anse, *Proctor 20298* (IJ). MONTSERRAT:

Shafer 700 (F, NY, US). NEVIS: *Box 172* (US); *Edwards 085 G* (MO). SABA: *Boldingh 2070* (US). ST. EUSTATIUS: *Boldingh 990* (P). ST. KITTS: *Hitchcock 16354* (US).

MEXICO. CHIAPAS: 50 km S of Palenque, *Beetle M-3902* (MO). 15 km WNW of Ocozocoautla, *Breedlove 29030* (MO). Laguna Miramar, *Breedlove 33311* (MO). Jct. of Río Perlas and Río Jataté, *Sohns 1590* (MEX, US). Near Ocosingo, *Ton 3475* (NY). JALISCO: Tequila, *Palmer 362* (F, GH, ISC, MEXU, MO, US). OAXACA: 5 mi N of Palomar, *Croat 40006* (MO). Temazcal, *Sousa 965* (MEXU), *1328* (MEXU). 3 km al E de Sarabia, *Vazquez 1448* (MO). Ubero, *Williams 9468* (F, US). QUINTANA ROO: Consumel Island, *Beetle M-4226* (MO). Tancah, *Swallen 2812* (US). Gozumel Island, *Swallen 2849* (US). SAN LUIS POTOSÍ: Tamazunchale, *Hitchcock & Stanford 7311* (US); *Kenoyer 1018* (F); *Lundell & Lundell 7119* (NY, MEXU, US), *12405* (MEXU, NY, UC, US). Tamasopo, *Pennell 18014* (GH, US). TABASCO: La Palma, *Matuda 3242* (F, GH, MEXU, US). VERACRUZ: 2 mi W of Córdoba, *Ballwinkel & Wunderlin 403* (WIS). 6 mi E of Coatzacoalcos, *Croat 40038* (MO). Near Tantoyuca, *Ervendberg 281* (GH). Córdoba, *Hitchcock 6456* (US). 4 km N of Minatitlán, *King 1057* (US). Km 56 Veracruz to Coatzacoalcos, *Leija & Garza 756* (MEXU). Ciudad Alemán Cosamaloapan, *Martínez-Calderón 1094* (UC). Zacuapan, *Purpus 2905* (F, GH, NY, UC, US). Vic. of Río Tonto, *Santos 2269* (US). YUCATÁN: Izabal, *Gaumer 1032* (F, GH, MEXU, MO, NY, UC, US). Chichankanab, *Gaumer 2144* (F, GH, NY), *2462* (F). Izabal, *Gaumer 2482* (F). Hunucmá, *Miranda 8087* (MEXU). Mérida, *Schott 675* (F, GH, MO, US). Chichen Itza, *Swallen 2410* (US), *2417* (US), *2452* (US), *2465* (MO, US), *2469* (US). Tizimin, *Swallen 2489* (US), *2512* (US), *2520* (US). Uxmal, *Swallen 2625* (US), *2641* (US). Peto, *Swallen 2706* (US).

NICARAGUA. CHONTALES: Vic. of La Libertad, *Standley 8999* (F). ZELAYA: Bilwaskarma, *Davidse & Pohl 2295* (ISC, MO). Bluefields, *Hampe 12-f* (GOET).

PANAMA. CANAL ZONE: Ancón Hill, *Killip 4028* (US). Albrook Air Force Base, *Stimson 5188* (NY, SCZ). COLÓN: 0.7 mi NE of Río Piedras, *Nee & Mori 3649* (MO, WIS).

PUERTO RICO: Río Piedras, *Blomquist 12083* (UC). Mt. Alegrillo, *Britton et al. 2623* (US). Vic. of Guanica, *Britton et al. 4955* (NY, US). Cayo Muertes, *Britton et al. 5006* (F, NY, US). Vic. of Catano, *Britton et al. 6991* (NY, US). Culebra Island, *Britton & Wheeler s.n.* (F, NY). Mayaguez, *Chase 6157* (US). Vic. of Mariaco, *Chase 6192* (US), *6225* (US). Aibonita to Cayey, *Chase 6335* (US). Vic. of San Juan, *Chase 6365* (US). Vic. of Vega Baja, *Chase 6420* (US), *6431* (US). Vic. of Arecibo, *Chase 6443* (US). Between Utado and Adjuntos, *Chase 6462* (US). Vic. of Guanica, *Chase 6521* (US). Coamo, *Chase 6543* (US). Vic. of Arecibo, *Chase 6560* (US). Vic. of Lares, *Chase 6587* (US). Manatí, *Chase 6610* (US). Viques Island, *Chase 6683* (US). Sierra de Luquilla, *Chase 6726* (US). Vic. of San Juan, *Chase 6782* (US). Mayaguez, *Chase 6814* (US). Mariaco, *Duke 7574* (MO), *7581* (MO). Bayaman, *Goll 227* (NY, US). Cuamo, *Goll 699* (NY, US). Mona Island, *Hess 454* (US). Mayaguez, *Holm 26* (F, GH, MO, US). Vic. of Vega Baja, *Liogier 9795* (IJ, NY). Susua, *Liogier 9899* (F, IJ, NY, VEN). Bayaman, *Liogier 10225* (IJ, US), *10254* (IJ, NY, US). Río Piedras, *Otero 255* (GH, MO, US). Mayaguez, *Sintensis 68* (GOET). Cayey, *Sintensis 2318* (F, NY, P, US), *2470* (MO, US). Mona Island, *Stevens 6337* (NY). Yauco, *Vélez 340* (NY).

UNITED STATES. FLORIDA: BREVARD CO.: Okeechobee Region, *Fredholm 5532* (GH, NY, US). COLLIER CO.: 1 mi NW of Paolita Station, *Ward & Beckner 5345* (GH, NY, US). DADE CO.: Miami, *Chase 3904* (US). Long Pine Key, *Cooley et al. 9197* (GH). Near Miami, *Correll 5974* (GH, US). 15 mi SW of Royal Palm Park Inn, *Deam 60320* (UC). Snapper Hammock, *Eaton 315* (F, GH, US). Tallahassee Hammock, *Eaton 418* (US). Miami, *Hitchcock s.n.* (US). 25 mi W of Miami, *Moldenke 3747* (NY). Biscayne Bay, *Palmer 630* (GH, MO, US). Royal Palm Hammock, *Palmer 27483* (A, MO). Miami, *Rehder 805* (A); *Rolfs & Quaintance 935* (US); *Small & Carter 64* (NY). Between Miami and Coconut Grove, *Small & Carter 561* (F, NY); *Small & Small 4624* (NY), *4647* (GH). Long Key, *Small 7345* (ISC, NY), *s.n.* (UC). Elliott's Key, *Small & Nash s.n.* (NY); *Tracy 9050* (F, GH, MO, NY). Miami, *Tracy 9320* (F, GH, MO, NY). MONROE CO.: Key West, *Blodget s.n.* (GH, US). Key Largo, *Brass 21136* (GH); *Chase 3930* (US); *Correll et al. 40304* (MO). Key West, *Garber s.n.* (NY, US). Big Pine Key, *Killip 32037* (GH, UC, US), *42259* (US); *Martin 1281* (NY, UC, US). Key Largo, *McFarlin s.n.* (NY); *Moldenke 407* (F, MO, NY, P, US). No Name Key, *Muenscher & Thorne 18131* (GH, UC). Key Largo, *O'Neill s.n.* (US). Stock Island, *Pennell 9621* (US). Key Largo, *Pollard et al. 157* (F, NY, US). Key West, *Porter s.n.* (F). Bear Lake Rd., *Robertson 257* (GH). Key West, *Rugel 111* (F, GH, M, NY, US). Big Pine Key, *Siebert 1290* (MO). Tibisee, *Silveus 5270* (US). Big Pine Key, *Simpson 337* (NY). Vaca Key, *Small & Carter 2864* (NY, US). Boca Chica Key, *Small 3947* (NY).

Sugar Loaf Key, *Swallen 5161* (US). Key Vaca, *Swallen 5200* (US). Near Flamingo, *Swallen 5248* (US). Big Pine Key, *Swallen 10668* (US), *10694* (US). 4 mi W of Dade-Monroe Co. line, *Ward & Burch 3306* (US). Stock Island, *Wilbur & Webster 2556* (GH, NY, US). PALM BEACH CO.: Near Palm Beach, *Curtiss 5530* (GH, MO, NY, P, UC, US); *Hitchcock 2547* (US); *Small 2133* (NY); *Webber 204* (MO, NY). ST. LUCIE CO.: S of Fort Pierce, *Small 8771* (NY).

VENEZUELA. ARAGUA: 16.3 km NW of Rancho Grande, *Davidse 3114* (ISC, MO). DISTRITO FEDERAL: Carayaca, *Jahn 312* (US, VEN), *321* (US, VEN). Sosa, *Tamayo 561* (VEN). LARA: Between Terepaima and Cabudare, *Steyermark et al. 103639* (VEN).

VIRGIN ISLANDS: ANEGADA: *D'Arcy 4843* (MO). ST. CROIX: *Raunkiaer 642* (P). Caanon, *Ricksecker 257* (F, GH, MO, NY, P, UC, US), *400B* (F, MO, US); *Rose et al. 3609* (GH, NY, US). *Thompson 385* (US), *430* (GH), *501* (US), *526* (US). ST. JOHN: *Eggers 3058* (M), *3121* (US). ST. THOMAS: *Biédle s.n.* (P). Water Island, *Britton et al. 141* (NY, US). *Eggers 77* (GOET, MO, P), *189* (US), *292* (US); *Hitchcock 16309* (US). Water Island, *Millspaugh 519* (F, NY, US). TORTOLA: Sage Mtn. Ridge, *D'Arcy 2075* (A). *Fishlock 240* (GH, NY); *Shafer 1142* (F, US).

WINDWARD ISLANDS. BARBADOS: Applewhaite's Gulley, *Dash 414* (NY). DOMINICA: *Beard 1370* (F, GH, US); *Hitchcock 16422* (US); *Imray s.n.* (GOET); *Smith & Smith 1105* (NY); *Smith 10306* (US). GRENADA: La Pastoria, *Broadway s.n.* (F, GH, NY, US). St. Davids, *Broadway s.n.* (M, MO). St. Mark Parish, *Proctor 17221* (A). MARTINIQUE: *Hahn 480* (P, UC); *Hitchcock 16458* (US); *Husnot 94* (US); *Stehlé 2086* (US), *4589* (IJ). ST. LUCIA: *Hitchcock 16496* (US); *Smith 10200* (US). ST. VINCENT: *Beard 1370* (MO); *Morton 4724* (US).

2b. **Lasiacis divaricata** (L.) Hitchc. var. **austroamericana** Davidse, Ann. Missouri Bot. Gard. 64: 374. 1978. TYPE: Brazil, Minas Gerais, near Santa Barbara do Caparaco, streamside, suffrutescent, 3 m high, climbing and rooting at lower joints, "canaviera," 21 Nov. 1929, *Mexia 4007* (NY, holotype; F, GH, MO, UC, US, isotypes).

Perennial; culms caespitose, 1–5 m tall, erect at the base, arching and scandent; internodes lignified, to 12 mm wide, hollow, glabrous or with a line of puberulence; nodes glabrous; sheaths usually glabrous, occasionally with a few scattered, delicate hairs near the apex, rarely puberulent throughout, the upper margin ciliate, the auricular hairs to 3 mm long; collar usually glabrous, rarely sparsely minutely puberulent or with a few scattered small hairs; ligule a whitish membrane 0.3–1.2 mm long, glabrous or ciliolate; blades narrowly lanceolate, 5–11(–14) cm long, 0.6–1.8(–3.0) cm wide, usually glabrous, occasionally with a few scattered hairs at the base of the upper and lower surfaces, rarely puberulent throughout, the base asymmetrical, rarely with a few cilia, the margin scabrid, the apex acute to acuminate; panicles small, 2–10(–14) cm long, the longest branch 1–4(–7) cm long, the branches ascending to spreading somewhat at maturity, scabrous and/or puberulent, the pulvini usually puberulent, occasionally glabrous; spikelets globose, 3.4–4.3 mm long, purple or green when immature; first glume (1.5–)1.7–2.4(–2.7) mm long, 7–11-nerved; second glume 9–13-nerved; sterile floret without or with a staminate flower, the anthers 1.7 mm long, the lemma 9–13-nerved, the palea ½ to equal the length of the fertile floret; fertile floret 3.3–3.7 mm long, 2.1–2.3 mm wide, the anthers ca. 2 mm long; caryopsis 2.3 mm long, 1.8–1.9 mm wide; chromosome number $n = 18$.

Ecology: This variety is found along brushy forest edges and in secondary forests. Elevation records range from 100 m to 1,700 m. Spikelet-bearing plants were primarily collected from November through May.

Distribution: *Lasiacis divaricata* var. *austroamericana* is known in Colombia and Brazil south through Peru, Bolivia, Paraguay, and northern Argentina.

Lasiacis divaricata var. *austroamericana* is characterized by its small, narrow, essentially glabrous leaves, small ligule, small panicles with ascending or slightly spreading branches, and globose, short-pedicelled spikelets. Although the overall aspect is glabrous, it is not uncommon to find a few scattered hairs near the base of the leaf blades along the midvein and on the upper part of the sheath.

This variety differs from *L. divaricata* var. *divaricata* in having ascending rather than reflexed panicle branches. This plus the globose spikelets easily differentiate the two. In addition, the leaves of var. *austroamericana* are more lax and not as strictly distichously arranged, and the branches are not or very little zigzag. In all these characters, var. *austroamericana* varies in the direction of *L. sorghoidea* var. *patentiflora* and the glabrous small-spikelet form of *L. nigra*. Parodi (1943) also noted this relationship stating that "esta especies es muy afin a *L. sorghoidea*." However, he did not consider the South American element of *L. divaricata* to be distinct from the Caribbean element.

ARGENTINA. MISIONES: Km 45 El Dorado, *Bertoni 982* (NY). Acaraque, *Bertoni 3100* (US). San José de Pindapoy, *Bridaralli 2625* (F). Parque Iguazú, *Del Puerto & Bescia 2663* (US); *Ekman 616* (US). Loreto, *Ekman 618* (US). 10 km de Cerro Azul, *Krapovickas et al. 15042* (WIS). Santa Ana, *Montes 1736* (F, US). Candelaria, *Montes 2221* (F, US). Feyucuare, *Montes 14802* (MO). Loreto, *Montes 27498* (MO). Colonia Roca, *Mutinelli 50* (US). Puerto Maní, *Schwarz 10232* (US, WIS).

BOLIVIA. BENI: E of Puerto Sucre, *Chase 11152* (US). COCHAMBA: Prov. Chapáre, *Steinbach 9091* (F, GH, GOET, MO, NY, US). LA PAZ: San Carlos, *Buchtien 22* (NY, US). Colaya, *Mexia 4307* (GH, MO, UC). Lower Cocas, *Williams 954* (NY). DEPARTMENT UNKNOWN: Mychariapu River, *Williams 962* (NY).

BRAZIL. CEARÁ: Crato, *Swallen 4356* (RB, US). ESPIRITO SANTO: Santa Teresa, *Sucre & Braga 4565* (MO). MARANHÃO: Ilha de Balsas Region, *Eiten & Eiten 4736* (NY). Barra do Corda to Grajahú, *Swallen 3773* (US). Grajahú to Porto Franco, *Swallen 3788* (US). MINAS GERAIS: 15 km N of Montalvânia, *Anderson et al. 37186* (MO). Juiz de Fóra, *Chase 8619* (F, GH, MO, NY, US). Visçosa, *Chase 9437* (F, GH, ISC, MO, NY, US). Caparo, *Chase 9644* (F, GH, MO, NY). São João del Rey, *Com. Geol. Geogr. 268* (US). Visçosa, *Irwin 2685* (F, NY, UC). Santa Barbara do Caparaó, *Mexia 4007* (F, GH, MO, NY, UC, US). PARANÁ: Itarare, *Dusén 9643* (MO, US). Morungava, *Dusén 16486* (F, GH, MO, UC). Salto Iguassu, *Rambo 53628* (US). 7 km E of Londrina, *Swallen 8733* (US). Campo Morão, Estevao, *Swallen 8959* (US). RIO GRANDE DO SUL: Pilveira Martins, *Lindman 1239.5* (US). Mun. de Montenegro, *Orth 2719* (MO, US). Lindha Bonita pr. Montenegro, *Rambo 40005* (MO, US). Pôrto Alegre, *Reineck s.n.* (GH). RIO DE JANEIRO: Petrópolis, *Chase 12168* (US). Alto Macahé, *Glaziou 17397* (NY, P). Corcovado, *Glaziou 20574* (P, RB, US); *Guillemin 739* (P). Petrópolis, *Jaes & Sionisio 127* (RB). Rio Bom Fim, *Soderstrom 1927A* (MO). Petrópolis, *Sucre & Braga 2752* (MO), *2763* (MO), *4505* (MO). SANTA CATARINA: Herval, *Dusén 11877* (GH). Ibirama, *Klein 2026* (UC). Morro Costa da Lagoa, *Klein 7201* (US). Nova Teutonia, *Planmann 312* (RB). Itapiranga, *Reitz 3775* (NY, UC, US). Alta Matador, *Reitz & Klein 7079* (NY). 9 km W of Popi, *Smith et al. 11783* (NY, UC, US). SÃO PAULO: Ca. 38 km SW of Jacupiranga, *Davidse et al. 10948* (ISC, MO, SP). Butantan, *Gehrt 2641* (US). Cantareira, *Hoehne 3974* (US). Parque do Estado, *Hoehne 29972* (F, NY). São Paulo, *Pickel 5804* (IPA, US). Butantan, *Usteri 9796* (US). Jaragua, *Usteri 9899* (US).

COLOMBIA. BOYACA: *Lawrance 219* (F, GH, MO, NY, US). MAGDALENA: San Andres de Sierra, *Pittier 1650* (US). SANTANDER: Between Suratá and California, *Killip & Smith 16794* (A, GH, NY, US).

PARAGUAY. Santa Bárbara, *Balansa 40a* (P). Puerto Franco, *Bertoni 1342* (NY). Vic. of Caaguazú, *Hassler 8920* (GH, NY). Sierra de Amambay, *Hassler 12087* (US). Near Villarriaca, *Jörgensen 3559* (F, MO, NY, US). Nacunday, *Montes 10926* (US). Sierra de Amambay, *Rojas 9864* (US).

PERU. CUSCO: Urubamba Valley, *Cook & Gilbert 923* (US). Machupicchu, *Vargas 2188*

(US). JUNÍN: Ereñas, *Killip & Smith 25615* (F, NY, US). DEPARTMENT UNKNOWN: Callacate, *Jelski 583* (US).

2c. **Lasiacis divaricata** (L.) Hitchc. var. **leptostachya** (Hitchc.) Davidse, Ann. Missouri Bot. Gard. 64: 375. 1978.

Lasiacis leptostachya Hitchc., Contr. U.S. Natl. Herb. 22: 19. 1920. TYPE: Nicaragua, Jinotepe, jungle, 500 m, stout central canes, branches more or less whorled and slender, floral branches conspicuously flexous, panicles all small, 7 Nov. 1911, *Hitchcock 8718* (US, holotype).

Plants perennial; culms caespitose, 2–5 m tall, erect at the base, arching and clambering into vegetation, the secondary branches 1 per node or fascicled, often zigzag; internodes of the main culms 3–8 mm thick, hollow to almost completely solid with pith, glabrous, or completely and densely appressed papillose-pubescent, with hairs to 1.5 mm long, deciduous in age leaving a roughened main culm, the internodes of branchlets usually glabrous or with a line of puberulence on one side, often completely or partially solid; nodes glabrous or rarely puberulent; sheath glabrous, the margins glabrous or the overlapping margin ciliate with hairs to 2.5 mm long, the auricular hairs to 3.5 mm; collar minutely puberulent or densely pubescent with hairs to 1.3 mm long; ligule membranous, 0.4–0.8(–1.3) mm long, tan, ciliate with hairs to 1.2 mm long; blades linear-lanceolate, 5–10 cm long, 0.4–1.1(–1.6) cm wide, usually completely glabrous, rarely minutely puberulent, the base asymmetrical, the margin scabrid, the apex acuminate; panicles small, the base usually included in the sheath, 1–7(–12) cm long, the longest branch 0.5–4.0 cm long, the branches glabrous, scabrous, or slightly puberulent, short, strictly ascending and appressed, diverging only in age, the pedicels then divergent, the pulvini puberulent below or glabrous; spikelets oblong, 4.2–5.0 mm long; first glume 1.7–2.4 mm long, 7–11-nerved; second glume 9–11-nerved; sterile floret with or without a staminate flower, the anthers 2.2 mm long, the lemma 9–11-nerved, the palea ½ to equal the length of the fertile floret; fertile floret 4.0–4.7 mm long, 1.8–1.9 mm wide, dark brown, the anthers 2.3–2.7 mm long; caryopsis 2.6 mm long, 1.5 mm wide.

Ecology: *Lasiacis divaricata* var. *leptostachya is* found along forest margins and brushy thickets of quebradas and in secondary vegetation up to 1,100 m. It has been collected from October to May.

Distribution: This variety is known from Oaxaca and Chiapas in Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama.

This taxon was known for many years only from the type specimen and in recent years has been confused with narrow-leaved Mexican and South American specimens of *L. nigra*. Its close relationship to *L. divaricata* var. *divaricata* has not been noted before, probably because the type was based on a specimen with papillose-pubescent culms, a character unknown in var. *divaricata*. A hint at the close relationship between *L. leptostachya* and *L. divaricata* was, however, made by Hitchcock through notations on his Nicaraguan collections. On two of these (*Hitchcock 8722, 8723*), he noted "=8718," the holotype of *L. leptostachya*. However, these two specimens were also annotated as *L. divaricata*

and so cited by him (Hitchcock, 1920). Variety *leptostachya* is similar to var. *divaricata* in having small, narrow, usually glabrous leaves, and inflorescences with finally reflexed panicle branches and divaricate pedicels. Since the panicles are partially included in the sheaths, they do not show the characteristic *divaricata* branching pattern until they are quite mature, and most herbarium specimens of this variety show only compact immature inflorescences. The spikelets tend to be less obovate than in var. *divaricata* and somewhat larger, but they resemble the spikelets of this species more than any other taxon. Variety *leptostachya* differs from var. *divaricata* in its narrower leaves, occasionally heavily pubescent culms, somewhat larger and more oblong spikelets, panicles usually partially included in the upper sheaths, and more densely arranged spikelets. Variety *divaricata* can best be distinguished from narrow-leaved, glabrate plants of var. *leptostachya* by the more open, exserted panicles.

All specimens but one bear small secondary panicles only. In *Rodríguez 1352* from Morazán, Honduras (F), one branch shows a distinctly larger terminal inflorescence.

COSTA RICA. ALAJUELA: El Rodeo, *Hunnewell 16552* (GH). GUANACASTE: Between Colonia Carmona and Buena Vista, *Jiménez 378* (US). Santa Rosa National Park, *Liesner 4229* (MO). Matambu, Nicoya, *Tonduz 13748* (P, US). SAN JOSÉ: Llano Grande de Puriscal, *Jiménez 892* (US).

EL SALVADOR. Vic. of San Salvador, *Calderón 508* (GH, NY, US). *Renson 323* (US). Vic. of Ahuachapán, *Standley & Padillo 2498* (F). Vic. of San Salvador, *Standley 19136* (GH, US). Vic. of Ahuachapán, *Standley 19878* (GH, MO, US).

GUATEMALA. CHIQUIMULA: Above El Rincón, *Standley 74696* (F, US). ESCUINTLA: Near Las Lajas, *Standley 58154* (F). JALAPA: Guastatoya, *Kellerman 7847* (F, NY). JUTIAPA: Vic. of Jutiapa, *Standley 74992A* (F), *75416* (F, US). SANTA ROSA: SE of Barbabecena, *Standley 77854* (F, US). La Sepultara, *Standley 79364* (F, US). SUCHITEPÉQUEZ: Above Patulul, *Standley 62204* (F, US). DEPARTMENT UNKNOWN: *Bernoulli 48* (NY); *Bernoulli & Cairo 930* (GOET), *951* (GOET).

HONDURAS. EL PARAÍSO: 32 km W of Danlí, *Davidse & Pohl 2145* (MO). LA PAZ: 5 km a Sabanetas, *Molina & Molina 13894* (US). OLANCHO: Rd. to Las Lomas, *Standley 18475* (F). MORAZÁN: Camino San Antonio, *Rodríguez 1352* (F).

MEXICO. CHIAPAS: 6.5 km W of Tuxtla Gutiérrez, *Breedlove 20164* (DS). Above El Chorreadero, *Breedlove & Thorne 20429* (DS). Near Riso de Oro, *Breedlove & Thorne 20697* (DS, MO). 13 km N of Arriaga, *Breedlove 28304* (DS, MO). NE of Jaltenango, *Miranda 6929* (MEXU). OAXACA: 9 mi SE of Tapanatepeque, *Breedlove & Raven 13704* (MEXU, NY).

NICARAGUA. BOACO: Boaco, *Seymour 3840* (F, GH, MO, NY). CARAZO: Jinotepe, *Hitchcock 8722* (US), *8723* (GH, US).

PANAMA. CANAL ZONE: Near Alahuela, *Dodge et al. 16513* (US). 1 mi N of Madden Dam, *Lazor 2945* (MO). Chagres Valley, *Pittier 2342* (GH, NY, US). Madden Lake, *Witherspoon & Witherspoon 8815* (ISC, MO, TAES). DARIÉN: Camp Dubaganala, *Duke 15495* (US).

3a. **Lasiacis grisebachii** (Nash) Hitchc. var. **grisebachii**, Bot. Gaz. (Crawfordsville) 54: 302. 1911.

Panicum grisebachii Nash, Bull. Torrey Bot. Club 35: 301. 1908. TYPE: Cuba, vicinity of Madruga, coral rock ravine, 28 Mar. 1903, *Britton, Britton & Shafer 758* (NY, holotype, fragment US).

Perennial; widely creeping and branching, forming low, dense mats, only the distal ends of the branches erect to 6 dm, rooting at the lower, procumbent nodes, forming long prop roots that remain unbranched above the soil surface;

culms relatively slender, 2–3 mm thick, herbaceous to moderately lignified, hollow but usually with striplike pith remnants which form an interconnecting network; internodes usually glabrous with a single line of puberulence, rarely the entire upper portion puberulent; nodes glabrous; sheaths usually puberulent, sometimes hirsute, rarely minutely puberulent between the nerves and appearing glabrous, the overlapping margin ciliate, the auricular hairs occasionally prominent and to 3.0 mm long; collar usually with a line of puberulence at its base; ligule an inconspicuous membrane, 0.3–0.6 mm long, glabrous, or sometimes minutely ciliolate; blades 6–14 cm long, 0.6–1.1(–1.4) cm wide, narrowly linear-lanceolate, the upper surface usually glabrous, less commonly sparsely puberulent, pubescent, or hirsute, the lower surface usually puberulent, at least at the base, occasionally glabrous, the margin scabrid, the apex acuminate, the base asymmetrical; panicles relatively small, (2–)5–13(–16) cm long, the longest branch 1–5(–7) cm, bearing evenly distributed spikelets throughout, the branches scabrid, the pulvini puberulent or sparingly pubescent at the lowest nodes; spikelets 3.5–3.8 mm long, globose; first glume 1.5–2.2 mm long, 5–7-nerved; second glume 7–11-nerved; sterile floret usually without a flower, sporadically with a rudimentary or fully developed staminate flower, the lemma 7–11-nerved, the palea equal or subequal to the length of the fertile floret; fertile floret 3.0–3.1 mm long, 2.3–2.5 mm wide, often with a sterile projection at its base, the anthers ca. 2.0 mm long.

Ecology: *Lasiacis grisebachii* var. *grisebachii* is primarily a forest species that occurs predominantly at elevations below 1,000 m, although occasional collections are from somewhat higher elevations. It is most often encountered in shade in secondary forest but occurs in undisturbed habitats as well. Spikelet-bearing specimens have been collected from late June to March in Central America and from late October to the middle of March in Cuba.

Distribution: *Lasiacis grisebachii* var. *grisebachii* extends from San Luis Potosí, Oaxaca, Puebla, and Veracruz south throughout the Yucatán Peninsula into Honduras. It is also found in the western half of Cuba.

In designating the type, Nash (1908) provided the following information: "Type specimen collected in the vicinity of Madruga, by Britton & Shafer *no.* 758, March 28, 1903, in the herbarium of the New York Botanical Garden." The label of the type specimen from NY actually states the collectors to be N. L. Britton, E. G. Britton, & J. A. Shafer, rather than Britton & Shafer as indicated by Nash. This appears to be a simple oversight in citation by Nash since all other information on the label corresponds to Nash's type citation, and I have seen no other specimen at NY which has otherwise identical label information. Hitchcock (1920, 1936) subsequently followed Nash in mistakenly citing *Britton & Shafer 758*.

Lasiacis grisebachii var. *grisebachii* is a relatively uniform taxon characterized by its creeping, hollow stems with pith remnants, short narrow blades, and small inflorescences with globose spikelets. The pith remnants in the culms many times have a distinct greenish tint which differs from the typically white or light tan pith of *L. linearis*, *L. rhizophora*, and *L. oaxacensis*, the three solid-culm

species of *Lasiacis*. The blades have a thick, smooth, dark green appearance that is difficult to describe but quite characteristic to one familiar with the species. A small, sterile projection at the base of the fertile floret is often present. The frequency of this structure is noticeably different in the two floristic regions the species occupies, since it occurred in 96% of the spikelets examined from Mexico and Central America but only in 37% of the Cuban specimens. Although this projection definitely represents the rachilla and floret of a second fertile floret, it is usually reduced to a narrow stalklike structure less than 1 mm long. In only one Cuban collection have I observed it to be more fully developed. On the whole, there is little other regional morphological differentiation of the species.

Poorly collected specimens without the lower, root producing nodes may be mistaken for *L. divaricata*. However, in the latter species, the spikelets are obovate, the panicle branchlets are reflexed at maturity, the culm is more robust and lignified, and the leaf blades are usually relatively shorter and broader than in *L. grisebachii*.

Hitchcock (1936) reported this species from the Oriente province in Cuba on the basis of *León 5685*. This specimen is actually *L. divaricata*. Furthermore, depauperate specimens of *L. divaricata* from Hispaniola have been identified at *L. grisebachii*. I have not seen any authentic specimens of *L. grisebachii* from this island.

BELIZE. BELIZE: Maskall Rd., *Gentle 866* (MO, NY, UC, US). Mi 22 on Western Hwy., *Liesner & Dwyer 1483* (MO). CAYO: Between El Cayo and Benque Viejo, *Bartlett 11505* (US). Vic. of Grano de Oro, *Croat 23334* (MO). Ca. 3 mi S of Grano de Oro, *Croat 23398* (MO). Hummingbird Hwy., *Gentle 8441* (F, IJ, NY, UC, US), *8864* (F, IJ, NY, US). 41 mi Belize-El Cayo Rd., *Gentle 9641* (F, IJ, NY, UC, US). Cohune Ridge, *Lundell 6451* (F, NY, US), *6751* (F, NY, US). Millionario, *Proctor 29866* (IJ). ORANGE WALK: Honey Camp, *Lundell 10* (F), *559* (GH, ISC, MO, NY, US). STANN CREEK: Lynam, *Dwyer et al. 544B* (MO). Hummingbird Hwy., *Gentle 8384* (F, IJ, NY, UC, US). TOLEDO: Río Grande, *Gentle 4798* (F, IJ, US). Edwards Rd. beyond Columbia, *Gentle 6523* (F, US), *6526* (US). Wilson Rd., *Gentle 6849* (F, IJ, NY, UC, US). El Dorado Rd., *Gentle 6965* (F, US). Near Columbia, *Gentle 7101* (F, IJ, ISC, US). Near San Antonio, *Gentle 7523* (F, IJ, NY, UC, US).

CUBA. HABANA: Lomas de Camoa, *Ekman A.G.N.H.794* (F, GH, MO, NY, P, UC). Loma de Coco, *Ekman A.G.N.H.1024* (GH, MO, NY, P, UC, US, WIS). Lomas de Camoa, *Ekman 13531* (F, NY, US); *León 1972* (US). Sierra de Anafe, *León 2874* (GH). La Vigia, Tapaste, *León 10666* (GH, NY, US). Jamaica, Loma de Somorrostro, *León & Roig 11438* (US). MANTANZAS: Santa Clara, Peninsula de Zapata, *Ekman 18340* (US). Mantanzas, *Rugel 187* (GH, GOET, NY). PINAR DEL RÍO: Las Pozas, Pan de Guajaibaí, *Alain 2415* (GH). Taco-Taco, *Baker 3817* (F, NY, US). Guanajay, *Baker & Van Herman 4264* (US). Cabañas, *Ekman 10506* (NY). Gerardo, *Ekman 12646* (US). 30 km N of Pinar del Río, *Hitchcock 23315A* (US). Viñales, *Killip 13528* (US). Sierra del Brujo, *León 12916* (GH, US). Viñales, *León 14715* (GH). Taco-Taco, *Morton 4276* (UC, US), *4306* (F, NY, UC, US), *4390* (GH, MO, US). N of San Cristóbal, *Roig 1183* (NY). Bahía Honda to El Rosario, *Shafer 12006* (F, NY, US). Sierra de Anafe, *Wilson & León 2874* (US). Vic. of Buenaventura, *Wilson 9238* (NY, US). Sierra de Anafe, *Wilson 11309* (F, NY, US); *Wilson & León 11467* (F, NY, US).

GUATEMALA. PETÉN: Vaxactum, *Bartlett 12190* (GH, NY, US). Dos Lagunas, *Contreras 1596* (IJ, US). Dolores, *Contreras 2849* (GH, US). Tikal, *Contreras 3903* (US); *Lundell 16144* (F, US). San Luis, *Lundell 16360* (US). Tikal, *Lundell 16665* (US). Sayaxche, *Lundell 17970* (US). Entre Libertad and Subin, *Molina 15503* (US). Tikal, *Ortíz 326* (F, ISC, MO, NY). Near San Diego, *Steyermark 45305* (F, US). QUEZALTENANGO: Between Finca Pirineos and Patzulín, *Standley 86936* (F, US).

HONDURAS. OLANCHO: 12 km S of Dulce Nombre de Culmí, *Davidse & Pohl 2442* (ISC, MO). SANTA BÁRBARA: Between Lago Yojoa and El Sauce, *Davidse & Pohl 2218* (ISC, MO). Lago Yojoa, *Pohl & Gabel 13410* (MO). Near El Sauce, *Williams & Molina 17986* (F, GH).

MEXICO. CAMPECHE: Monterrey, *Lundell 1243* (F, GH, ISC, NY, UC, US). CHIAPAS: 32 km N of Ocozocoautla, *Breedlove & Raven 13566* (MEXU); *Breedlove 38201* (MO). 32 km NW of Ocozocoautla, *Breedlove 27463* (MO). 6–12 km S of Palenque, *Breedlove 28838* (MO). 13 km N of Berriozábal, *Breedlove & Dressler 29722* (MO). OAXACA: 1 km N of Tolosito, *Pohl & Davidse 11819* (ISC, MO). Jct. of Río Perlas and Río Jataté, *Sohns 935* (MEXU). Tuxtepec, *Sousa 935* (MEXU). PUEBLA: Cerro de Tlaquexpa, *Santos 2594* (ISC, US). Xicotepec de Juárez, *Scheinvar 605* (MEXU). QUINTANA ROO: Laguna Chichan Canab, *Swallen 2750* (MEXU, MO, US). Tancah, *Swallen 2823* (US). SAN LUIS POTOSÍ: Tamasunchale, *Kenoyer 375* (MO). VERACRUZ: Between Martínez de la Torre and Misantla, *Gómez-Pompa & Riba 183* (MEXU). Zongolica, *Santos 2650* (NY), *3734* (NY, US).

3b. **Lasiacis grisebachii** (Nash) Hitchc. var. **lindelieana** Davidse, Ann. Missouri Bot. Gard. 64: 375. 1978. TYPE: Cuba, Habana, Lomas de Camoa, in siloa locis umbrasis satis frequens, 27 Nov. 1921, *Ekman 13530* (US-1295003, holotype; F, NY, US-1502317, isotypes).

Similar to var. *grisebachii* except in the following respects: sheaths puberulent, ciliate on the overlapping margin; collar with a line of puberulence at its base; auricular hairs 1.5–2.0 mm long; ligule a glabrous membrane, 0.5–0.7 mm long, occasionally minutely ciliate; blades linear-lanceolate to lanceolate, 9–14 cm long, 1.5–2.0 cm wide, glabrous on both surfaces; panicles 8–13 cm long, the longest branch 4–7 cm long; spikelets 3.8–4.0 mm long; first glume 1.7–1.8 mm long; sterile palea equal in length to the fertile floret.

Ecology: Variety *lindelieana* is ecologically similar to var. *grisebachii* in being a forest species. Flowering specimens have been collected in November.

Distribution: This variety is known only from Pinar del Río, Habana, and Mantanbas, the three most western provinces in Cuba.

Five Ekman collections from Cuba, including the type of this variety, and one from the Dominican Republic were treated by Hitchcock (1936) as the only West Indian representatives of *L. rhizophora*. I do not concur with Hitchcock's treatment. The Dominican specimen is discussed under *L. rhizophora*. The Cuban specimens have the hollow culms, glabrous blades with essentially nonciliate ligules, globose spikelets with well-developed sterile paleas, and the small inflorescences with evenly distributed spikelets characteristic of *L. grisebachii*. They do differ noticeably from the majority of the representatives of this species in having broad blades (1.5–2.0 cm) which are similar to narrow-leaved specimens of *L. rhizophora*. This is the only resemblance; in all other respects this taxon resembles *L. grisebachii*. Attached to the type specimen on two handwritten labels is the proposal by Ekman for a new name, *L. lindelieana*, as well as the following information:

"Obs. I. Same kind of localities as *L. grisebachii*. To date known from two localities only, Río de Mosquitos in Prov. Pinar del Río and Lomas de Camoa near Habana. Obs. II. Dedicated to my friend Mr. A. R. Lindelie from St. Petersburg, Fla., administrator of San Ramón near Muriel, where I have been living these last two years. Obs. III. Related to *L. grisebachii*, but easily recognized on its broader, smoother, nearly glabrous blades and its more robust nature."

Ekman cooperated closely with Hitchcock in his West Indian botanizing. Since Hitchcock judged the specimens to represent an outlying population of the more southernly distributed *L. rhizophora*, Ekman's name was never published and for many years survived only as a herbarium name. I believe Ekman was correct in recognizing these specimens to represent a new taxonomic entity which is closely related to *L. grisebachii*. Infraspecific, rather than specific status is warranted since the plants differ most notably only in the broad blades. In most other *Lasiacis* species, even such recognition would be difficult to justify. However, the bulk of *L. grisebachii* var. *grisebachii* specimens do have distinctly narrower blades. This gives this broad-bladed group of specimens a very distinctive appearance.

CUBA. HABANA: Lomas de Camoa, *Ekman A.G.N.H.1023* (GH, ISC, MO, NY, P, UC, WIS), *13511* (F, GH, US), *13530* (F, NY, US). Urdagme Hill, near Jamaica, *León 1969* (US). MANTANZAS: Pan de Mantanzas, *Ekman 16464* (US). PINAR DEL RÍO: Mariel, *Ekman 13046* (US). Sierra de los Organos, Grupo del Rosario, *Ekman 17542* (NY, US).

4. **Lasiacis harrisii** Nash, Torreya 13: 274. 1913. TYPE: Jamaica, vicinity of Cinchona, Cinchona to Strawberry Hill, 2–10 Sep. 1906, *Marble 222*. (NY, holotype).

Perennial; culms 1–6 m long, slender, caespitose, erect at the base and arching above, commonly climbing or clambering into surrounding vegetation; internodes of main culms hollow, 2–4 mm thick, glabrous, those of the ultimate branchlets with a line of hairs; nodes glabrous; primary branches usually 1 per node, the secondary and tertiary branches often fascicled with 2 or more per node, the ultimate branchlets slender, hanging down in sprays; sheaths usually glabrous, those of young leaves sometimes sparsely pubescent, these becoming glabrate with maturity, the upper margin ciliate with hairs ca. 1.5 mm long, the auricular hairs few but prominent, to 3.5 mm long; collar glabrous; ligule membranous, 0.4–0.7 mm long, glabrous; blades linear, 6–12 cm long, 0.3–0.7 mm wide, often glabrous, sometimes pubescent at the base and along the midrib, rarely pubescent throughout in young leaves, the base slightly asymmetrical, rarely with a few cilia on the margin, the apex acuminate, the margin scabrid; panicles small and narrow, 2–7 cm long, with short, scabrid, appressed branches, the base included in the upper sheath, the pulvini glabrous; spikelets 3.7–4.0 mm long, first glume 2.0–2.5 mm long, 9-nerved; second glume 9-nerved; sterile floret without a flower, its palea ⅔ to subequal the length of the fertile floret, the lemma 9-nerved; fertile floret 3.2–3.4 mm long, 1.8–1.9 mm wide; caryopsis 2.2 mm long, 1.5 mm wide; chromosome number $n = 18$.

Ecology: *Lasiacis harrisii* grows in moist, montane forests and cloud forests from 800 to 1,500 m. It has been collected from October to November.

Distribution: *Lasiacis harrisii* is endemic to the Blue Mountains of eastern Jamaica.

Lasiacis harrisii is characterized by the relatively long, narrow blades with glabrous collars and small, narrow, partially included panicles with short appressed panicle branches. It is most closely related to *L. divaricata* var. *divaricata*

from which it can be distinguished, in addition to the characters just mentioned, by the tendency to a somewhat larger first glume, by the narrower elliptic spikelet that is not obovate as in *L. divaricata*, and by its relatively straight branches which in *L. divaricata* are usually zigzag.

The distinction between *L. harrisii* and *L. divaricata* var. *divaricata* is not very great, and specific distinction is only maintained with hesitation. There are a number of collections of *L. divaricata* from throughout the West Indies that approach *L. harrisii* vegetatively in having narrow leaves. Most of these collections represent highly branched plants which have proportionally shorter blades than those of *L. harrisii*. This, along with the reflexed or widely spreading branches bearing obovately shaped spikelets, serves to distinguish these *L. divaricata* specimens from true *L. harrisii*.

I differ from Hitchchock (1936) in assigning four Chase collections from Puerto Rico to *L. divaricata* var. *divaricata*. Although these collections resemble Jamaican *L. harrisii* rather closely vegetatively, they differ in having puberulent collars and in having pancile branches which are more divergent and bear more obovately shaped spikelets. In addition, there are other collections from the Dominican Republic, St. Vincent, and Marie Galante which also seem to bridge the gap between *L. harrisii* and *L. divaricata*. These have also been assigned to *L. divaricata*. The number of these intermediate collections is small in proportion to those that are "good" *L. divaricata*, and for this reason, I have maintained these two taxa at the specific level. It would, however, be very valuable to be able to hybridize these two species to determine whether sterility barriers exist. If such studies showed no or only weak barriers, then treating *L. harrisii* at an infraspecific level might better reflect its relationship with *L. divaricata* var. *divaricata*. Observation in the field in Jamaica indicated no overlap between the two species, which seem ecologically rather well separated.

Examination of two Jamaican populations, in addition to the herbarium specimens, failed to turn up plants having larger terminal inflorescences at the end of the main culms. All culms had a few to many small inflorescences on the ultimate branchlets of the culm. In this respect, *L. harrisii* resembles *L. scabrior* which also lacks the large terminal inflorescences so characteristic of all other *Lasiacis* species. The resemblance is further strengthened in that the lower part of the inflorescences of both species are included in the upper sheath.

JAMAICA. PORTLAND: Greenhills to Section, *Adams 9878* (M). Muriel's Rock, *Davidse & Proctor 3242* (MO). Upper Nanny Falls, *Morley & Whitefoord 758* (MO). Between Section and Hardwar Gap, *Proctor 23405* (IJ). ST. ANDREW: Yallah's Bridge below Chestervale, *Davidse & Proctor 3248* (MO). Mt. Faraway, *Harris 11486* (F, IJ, NY). Strawberry Hill, *Harris 11487* (MO, P). Catherine Peak, *Harris 11552* (F, GH, MO, NY, P, US); *Hitchcock 9726* (MO, US), *9730* (US). Chestervale, *Proctor 23834* (IJ). Port Royal Mts., *Proctor 25592* (IJ). ST. THOMAS: Farm Hill, *Orcutt 3544* (MO, US). Vic. of Whitfield Hall, *Proctor 9585* (IJ). PARISH UNKNOWN: Below Cold Spring Gap, *Harris 11354* (NY, US). Abbey Green, *Harris 11587* (F, GH, MO, NY, P, US); *Hitchcock A.G.N.H.588* (F, GH, MO, NY. P, US).

5. **Lasiacis ligulata** Hitchc. & Chase, Contr. U.S. Natl. Herb. 18: 337. 1917. TYPE: Trinidad, near Port of Spain, above St. Anns, among bushes along

stream, high climbing, 28 Nov. 1912, *Hitchcock 10007* (=Amer. Grass Natl. Herb. No. 589) (US-865564, US-865565, holotype; F, GH, MO, NY, isotypes).

Panicum fruticosum Salzm. ex Steud., Syn. Pl. Glum. 1: 74. 1854, pro syn. TYPE: Brazil, Bahia, *Salzmann* (US).

P. megacarpum Steud. in Lechl., Berb. Amer. Austr. 56. 1857, nom. nud. TYPE: Peru, in silvis uliginosis prope San Govan, *Lechler 2219* (GOET, P).

P. divaricatum L. var. *puberulum* Griseb., Fl. Brit. W. Ind. 551. 1864. TYPE: Trinidad, *Mr. Crueger s.n.* (GOET, holotype).

P. divaricatum var. *puberulum* Sodiro, Anales Univ. Centr Ecuador 1889: 5. 1889, nom. nud. non *P. divaricatum* var. *puberulum* Griseb., 1864.

P. maculatum Aubl. var. *pilosa* Fourn., Mex. Pl. 32. 1886. TYPE: Brazil, Bahia, *Salzmann* (P, lectotype).

Perennial; culms 1–5(–10) m tall, caespitose, erect at the base, arching above, the branches solitary or fascicled at the nodes; internodes glabrous or with a line of puberulence on the side, rarely puberulent throughout at the apex, hollow, 6–13 mm thick, lignified; nodes glabrous; sheaths glabrous, puberulent, rarely pubescent, the overlapping sheath margin usually ciliate, rarely completely glabrous; collar sparsely to densely puberulent, or occasionally glabrous; ligule membranous, (1.6–)2.0–3.0(–3.7) mm long, dark brown, sometimes pale, glabrous or appressed pubescent, the margin ciliate with hairs 0.5–2.5 mm long, the apex glabrous or ciliolate with hairs 0.2–0.5 mm long; blades narrowly to broadly lanceolate (5–)7–14(–17) cm long, (0.6–)1.0–2.2(–3.4) cm wide, glabrous or puberulent, the base asymmetrical, rarely ciliate with a few long hairs, the margin scabrid, the apex acuminate; panicles 2–17(–21) cm long, the longest branch 1–8 cm, spikelet density moderate, the panicle branches usually reflexed, or sometimes only widely spreading, glabrous or minutely scabrid above, rarely puberulent, the pulvini usually glabrous, occasionally puberulent; spikelets (3.0–)3.2–3.8(–4.1) mm long, usually purplish when immature; first glume (1.4–)1.7–2.0(–2.3) mm long, 7–11-nerved; second glume 9–11-nerved; sterile floret usually without a flower, rarely with a staminate flower, the lemma 9–11-nerved, the palea ¾ to equal the length of the fertile floret; fertile floret 2.8–3.1(–3.5) mm long, 1.9–2.3 mm wide, dark brown, the anthers 1.6–2.1 mm long; caryopsis 1.8–2.1 mm long, 1.6–1.9 mm wide; chromosome number $n = 18$.

Ecology: *Lasiacis ligulata* is typically found along brushy forest margins, in thickets, in secondary vegetation, along river banks, along roadsides, and in forest openings. The majority of collections are from below 1,000 m but from western South America, elevations of up to 2,100 m have been recorded. In the southern part of its range in South America, spikelet-bearing plants have been collected primarily from March to August. In the northern part and the West Indies, *L. ligulata* has been collected primarily from June to March.

Distribution: *Lasiacis ligulata* occurs from the Dominican Republic south through the West Indies, the Guianas, Brazil, and Bolivia. It is common in Peru but relatively rare in Ecuador, Venezuela, and Colombia.

This species long went unrecognized as a distinct entity, but it is the most common one in the Guianas and Brazil. As Hitchcock & Chase (1917) noted after their description, it is closely related to *L. divaricata* (var. *divaricata* of this treatment). *Lasiacis ligulata* can best be distinguished from the latter taxon

by its longer ligule. The nearly straight, not zigzag, culms, and smaller spikelets that are usually purplish, not green, when immature also distinguish *L. ligulata* from *L. divaricata* var. *divaricata*. The spikelet density in the panicle is also greater than in *L. divaricata*, and the pedicels of *L. ligulata* tend to be shorter and do not diverge as widely at spikelet maturity as those of *L. divaricata* var. *divaricata*. Moreover, puberulence on the lower blade surface is common in *L. ligulata* but quite rare in *L. divaricata*. See also under *L. sorghoidea* for a discussion of intergradation with that species.

The most common form, as described by Hitchcock & Chase (1917), has blades glabrous on the upper surface and on the back of the sheath, whereas the collars and lower blade surfaces are puberulent. This form extends throughout the range of the species but is especially common in the West Indies, the Guianas, and the upper half of Brazil. Also found in Brazil is a form that is completely glabrous, except for some puberulence on the collar. This glabrous form is found in northern Brazil, including Maranhão, Pará, and Amapa and appears again throughout Peru where it is the dominant form. A completely puberulent form is most common in central and southern Brazil from Pernambuco to Mato Grosso and south through the remainder of the southern range of this species.

Common names: Brazil: Pará, taboquinha, *Archer 8254*. West Indies: Tobago, tibisee, *Andrews 610A*.

BOLIVIA. Antochuacorna, 150 km NW of Cochabamba, *Buchtien 2499* (US). 4 km N of Santiago de Chiquitos, *Cutler 7007* (US). Guanai, *Rusby 191* (GH, NY). Head of the Beni River, *White 1004* (NY, US).

BRAZIL. ACRE: Vic. of Campinas, *Forero et al. 6310* (MO). Rio Juruá-Mirim, *Maas et al. P13109* (MO). AMAPÁ: Macapá, *Black & Fróes 51-12282* (US). Serra do Navio, *Cowan & Maguire 38105* (F, NY, RB, US). Tumac Humac, *de Granville 1380* (CAY). Mt. Carupina, *Pires & Westra 48844* (M, NY, US). Near Pôrto Platon, *Pires et al. 51007* (NY, US). Vic. of Igarape Ariramba, *Pires & Cavalcante 52353* (MO, US). Calcoene, *Pires & Cavalcante 52548* (MO, US). Trijonction-Mitaraka, *Sastre 1610* (CAY), *1672* (CAY). AMAZONAS: Manaus, *Chagas 3794* (US); *Ducke 150* (US). Ilha de Bates, Rio Tocantinus, *Pires & Black 2106* (US). Rio Purus, *Prance et al. 13723* (MO). BAHIA: Rodovia Itabuna to Ilhéus, *Belém 1657* (US). Vic. of Bahia, *Chase 8027* (GH, MO, US). Colonia de Gongugy, *Curran 36* (F, GH), *557* (F, GH). Porto Seguro, *Lanna & Castellanos 1484* (MO). Bahia, *Salzmann s.n.* (P-475074). Cruz de Almas, *Santos & Sacco 1921* (US). Near Itabus, *Silva 58356* (US). Ca. 48 km N of Itabebí, *Soderstrom et al. 2132* (MO). Reserva Biológica do Pau Brasil, *Soderstrom et al. 2190* (MO). CEARÁ: Serra de Baturité, *Eugenio 1198* (RB). Assemi, *Sucre & Silva 9257* (RB). DISTRITO FEDERAL: Ca. 25 km N of Brasília, *Irwin et al. 13958* (MO, US). Parque Municipal do Gama, *Irwin et al. 14155* (MO, US); Praia de Sernambetiba, *Smith 6335* (US). Near Guaratiba, *Smith 6510* (US). Country Club, *Sucre 447* (RB, US). ESPIRITO SANTO: Jatiboca, *Brade et al. 18411* (RB). Alegre, *Chase 10048* (US). Espirito Santo. *Kuhlmann 110577* (RB). Near Muqi, *Soderstrom & Sucre 1957* (MO). Reserva de Sooretama, *Sucre 5522* (MO). Vitoria, *Sucre & Araujo 10743* (MO). GOIÁS: Serra Geral do Paraná, *Anderson 7537* (MO). Between Viannapolis and Ponta Funda, *Chase 11321* (F, GH, NY, US). Vic. of Goiás, *Chase 11459* (MO, US). Coyandira, *Chase 11589* (US). Santa Rita do Paranahyba, *Chase 11642* (US). Between Jataly and Rio Araguarja, *Chase 11748* (US). 31 km N of intersection of Hwy. BR-153 and GO-54, *Davidse et al. 12241* (MO). Southern Serra Dourada, *Dawson 15027A* (US). Serra do Morcêgo, *Irwin et al. 15155* (MO). Chapada dos Veadeiros, *Irwin et al. 24186* (MO), *24237* (MO). GUANABARA: Restinga de Grumarin, *Almeida 1313* (MO). Gávea, *Duarte 5221* (MO, RB). Rio de Janeiro, *Plowman & Sucre 2763* (US). Serra da Mendanha, *Soderstrom & Sucre 1948* (MO). Alto da Boa Vista, *Sucre 2098* (MO); *Sucre et al. 4111* (MO). Pedra de Itanua, *Sucre et al. 5024* (MO). Serra do Mendanha, *Sucre et al. 6555* (MO). MARANHÃO: 35 km S of Loreto, *Eiten & Eiten 4320* (US). São Luiz, *Fróes 11871* (F, NY, US). Vila Rondon, *Pinheiro 33* (MO).

MATO GROSSO: Vic. of Dourados, *Chase 10969* (F, MO, NY, US). Santa Amia da Chapoda, *Malme 3357* (US). MINAS GERAIS: Juiz de Fóra, *Chase 8610* (F, US). Lavras, *Chase 8788.5* (US). 110 km NE of Bello Horizonte, *Chase 9103* (F, GH, MO, NY). Serra do Curral, *Chase 9304* (US). Viçosa, *Chase s.n.* (US). Ca. 15 km W of Pará de Minas, *Davidse & Ramamoorthy 10816* (ISC, MO). Ca. 27 km SE of Coroaci, *Davidse et al. 11477* (ISC, MO). Ca. 8 km N of Teófilo Otoni, *Davidse et al. 11500* (MO). Parque Estadual do Rio Doce, *Heringer & Eiten 15025* (MO), *15106* (MO), *15220* (MO). Visçosa, *Irwin 2741* (F, NY, UC). Serra do Espinhaço, *Irwin et al. 23138* (MO). 15 km N of São Jão da Chapada, *Irwin et al. 28160* (MO, NY, US). Visçosa, *Kuhlmann 1951* (ISC, MO), *1952* (US). Bello Horizonte, *Kuhlmann s.n.* (MO, US). Viçosa, *Mexia 5328* (F, GH, MO, NY, UC, US). Itabira, *Sampaio 7041* (US). PARÁ: Belém, *Archer 8254* (US). Urucuribaba, *Archer 8403* (US). Vic. of Pará, *Baker s.n.* (US). Belém, *Black & Murça Pires 122* (RB). Belterra, *Black 47-1052* (US). Rio Tapajós, *Dahlgren & Sella 198* (F, US); *Ducke s.n.* (RB-79247). Bragança River, *Goeldi 38* (F, MO, NY, US), *70* (NY, US). Majaró Island, *Goeldi 227* (F, US). Vic. of Pará, *Killip & Smith 30379* (NY, US). Vic. of Santarém, *Kuhlmann 2002* (MO, US). Peixe River, *Pires 3389* (COL, UC). Serra do Cachimbo, *Prance et al. 25017* (MO). Vic. of Paragominas, *Prance & Silva 58699* (MO). Altamira, *Silva et al. AS185* (MO). São Goetamo, *Silva 660* (US). Santarém, *Silva & Souza 2247* (MO, NY). Belém, *Soderstrom 1198* (US). Boa Vista, *Swallen 3175* (RB, US). Aramanshy, *Swallen 3215* (RB, US). Mosqueira, *Swallen 4871* (US), *4879½* (US). Santa Isabel, *Swallen 5051* (ISC, RB, US). Near Santarém, *Zery 531* (F). PARANÁ: Yacarchy, *Dusén 6605* (GH), *7898* (MO, NY). Alexandria, *Dusén 11487* (MO, NY, US). Yacarchy, *Dusén 14050* (GH, MO, US). Pinheirinho, *Hatschbach 14091* (F). Tararchy, *Jönsson 138A* (F, UC, US). Rolandia, *Swallen 8756* (US), *8757* (US). Rio do Vargen, *Swallen 9005* (US). PERNAMBUCO: Garanhuns, *Chase 7833* (F, GH, MO, US). Saltinho, *Falcão et al. 912* (MO, RB). Olinda, *Leal & Silva 14* (MO). Tapera, *Pickel 49* (F), *106* (US), *1359* (US), *s.n.* (F, GH). Recife, *Tenório s.n.* (MO). RIO DE JANEIRO: Ilha Queimada, *Amaral & Domingues 3935* (US). Serra da Estrella, *Brade 20104* (US). Serra Carioca, *Carauta 833* (RB). Bay of Rio, *Chase 8385* (US). Corcovado, *Chase 9744* (F, GH, MO, NY, US). Vic. of Rio de Janeiro, *Chase 9796* (F, US). Furnas do Agassiz, *Chase 12131* (US). Env. de Rio de Janeiro, *Commerson s.n.* in 1767 (P). Parati, *Eiten & Eiten 6279* (MO). Rio de Janeiro, *Gaudichaud 303* (P). Inoõ, *Gomes et al. 1217* (RB, US). Restinga da Tijuca, *Machado 78* (RB), *s.n.* (MO, RB). Lagoinha da Gavea, *Machado s.n.* (RB). Corcovado, *Rose & Russell 20156* (NY, US), *20312* (NY, US). Rio de Janeiro, *Saint-Hilaire 126* (P). Vic. of Meio da Serra, *Smith & Brade 2284* (F, GH, NY, UC, US). Velha–Petrópolis, *Soderstrom & Sucre 1872* (MO). 2 km SW of Baira, *Soderstrom & Sucre 1914* (MO). Between Cachoeiro de Macacu and Nova Friburgo, *Soderstrom & Sucre 1976* (MO). Ilha Furtada, *Sucre & Bragga 2588* (MO), *2628* (MO). Pedro de Rio, *Sucre & Bragga 2644* (MO). Petrópolis, *Sucre & Bragga 4239* (MO). Rio Vermelho, *Sucre & Silva 9168* (MO). Env. de Rio de Janeiro, *Weddell 255* (P). RONDÔNDIA: Abunã to Rio Branco, *Prance et al. 5954* (MO). 1 km N of Riberão, *Prance et al. 6451* (MO). Vic. of São Lorenço mines, *Prance et al. 8926* (MO). São Luiz, *Rosa 813* (MO). RORAIMA: Serra Tepequem, *Prance et al. 4311* (MO, US). SANTA CATARINA: Itajaí, *Klein 1194* (US), *1305* (US), *1320* (US). Moro de Inglezes, *Klein et al. 6689* (US). Ilha Santa Catarina, *Reitz & Klein 727* (US). Morro da Fazenda, *Reitz & Klein 1711* (NY, UC, US). Itají, *Reitz & Klein 1958* (US), *2874* (NY, UC, US), *2951* (US). SÃO PAULO: E of Pôrto Alvorado, *Eiten et al. 5995* (MO). Nova Europa, *Hoehne 13613* (GH, US). Mogy to Mirim, *Hoehne 20404* (NY, US). Araraquara, *Loefgren 9799* (US). Pindorama, *Mendes 4557* (US). Loreto, *Sampaio 4486* (US). Campinas, *Viegas 3839* (US).

COLOMBIA. AMAZONAS: Río Loretoyacu, *Black & Schultes 46-185* (US); *Schultes & Black 8313* (GH, US). Río Orteguaza, *Woronow & Juzepczuk 6379* (US). CUNDINAMARCA: 28 km NE of Gachela, *Grant 10549* (US). PUTUMAYO: Río San Miguel en la Bermeja, *Cuatrecasas 11025* (COL, F, US).

DOMINICAN REPUBLIC. DISTRITO NACIONAL: Vic. of Ciudad Trujillo, *Allard 16374* (US). LA VEGA: Vic. of Piedra Blanca, *Allard 13333* (A, US), *17779* (US), *17785* (US). La Cumbre, *Augusto 502* (NY). MARIA TRINIDAD SÁNCHEZ: Río San Juan, *Miller 1184* (US). SAMANÁ: Vic. of Sánchez, *Abbott 121* (GH, IJ, US).

ECUADOR. NAPO: El Napo, *Benoist 4743* (P). Santa Cecilia, *Dwyer & Simmons 9753* (MO). Near Tena, *Mexia 7218* (F, UC, US). Limoncocha, *Mowbray 69946* (NY). PASTAZA: 20 km along Río Pastaza, *Holm-Nielsen & Jeppesen 578* (AAU). PICHINCHA: NE of Tandayapa, *Solís 17159* (US). TUNGURAHUA: Between Baños and Cashurco, *Hitchcock 21863* (US).

FRENCH GUIANA. Vic. of Cayenne, *Broadway 225* (GH, NY, US), *389* (GH, NY, US), *415*

(GH, NY, US), 533 (US), *654* (GH, NY, US), *685* (GH, US), *712* (GH, NY, US). Saül, *Descoings & Luu 20539* (CAY); *de Granville B-4419* (CAY). Trois Sauts, *Grenand 524* (CAY, MO); *Lescure 384* (CAY); *Haxaire 962* (CAY). Cayenne, *Hoock s.n.* (NY), *89* (CAY). Rivière Comté, *Oldeman B-2063* (CAY). Ile de Cayenne, *Oldeman B-3485* (CAY). Saül, *Oldeman B-3926* (CAY), *B-4217* (CAY). Haut Maroni, *Sastre et al. 3864* (CAY, MO).

GUAYANA. NORTHWEST: Waini River, *La Cruz 1132* (MO), *3663* (F, GH, MO, NY, UC, US). Assakatta, *La Cruz 4291* (F, GH, MO, NY, UC, US), *4313* (F, GH, MO, NY, UC, US). POMEROON: Maruka River, *La Cruz 2544* (F, GH, MO, NY, UC, US). Pomeroon River, *La Cruz 2931* (F, GH, NY, US). DISTRICT UNKNOWN: Aruka River, *Fanshawe 5127* (A, NY). Potaro River, *Gleason 70* (GH, NY, US); *Hitchcock 17345* (US), *17553* (F, GH, MO, NY, UC, US), *17567* (US). Upper Demarara River, *Jenman 4089* (US). Isherton, *Smith 2417* (F, GH, NY, US).

PERU. AMAZONAS: E of Huampami, *Berlin 1514* (MO). Quebrada Huampami, *Kayap 903* (MO). Quebrada Wampushik, *Kayap 952* (MO). 1 km SE of Yambrasbamba, *Wurdack 1048* (F, NY, US). Shipsbamba to Pomacocha, *Wurdack 1096* (F, NY, US). Valley of the Río Marañon, *Wurdack 1807* (F, NY, RB, UC, US). AYACUCHO: Aina, *Killip & Smith 22724* (NY, US). Near Kimpitiriki, *Killip & Smith 22937* (F, NY, US). Estrella, *Killip & Smith 23080* (NY, US). CUZCO: Prov. Pancartambe, *Marin 1526* (F); *Vargas 14695* (US). HUÁNUCO: Vic. of Tingo Maria, *Belshaw 3086* (F, GH, MO, NY, UC); *Ferreyra 920* (US), *13141* (US). Villa Isabel to Cuchares, *Woytkowski 1258* (GH, MO). JUNÍN: Vic. of Colonia Perene, *Hitchcock 22116* (US), *22119* (US). 9 km SW of San Ramón, *Iltis et al. 313* (ISC, WIS). La Merced, *Killip & Smith 23451* (F, NY, US). San Ramón, *Killip & Smith 24896* (NY, US). Vic. of Colonia Perene, *Killip & Smith 24987* (NY, US), *25255* (NY, US). Puerto Yessup, *Killip & Smith 26327* (F, NY, RB, US). Cahuapanas, *Killip & Smith 26726* (F, GH, NY, US). San Francisco de Satipo, *Solomon 3240* (MO). LORETO: Santa Maria below Yurimaguas, *Anderson 770* (UC, US). Iquitos, *Asplund 13994* (US), *14378* (NY, US). Piscigranja Quistococha, *Ayala 693* (MO). Río Paranapura, *Croat 17874* (MO). Quebrada Tahuayo, *Croat 19761* (MO). Vic. of Aguaytia, *Croat 21008* (MO). Iquitos, *Killip & Smith 27088* (F, NY, US), *27125* (F, NY, RB, US). Vic. of Yurimaguas, *Killip & Smith 27561* (F, NY, US), *28266* (NY, US), *29085* (F, NY, US). Iquitos, *Klug 1398* (F, NY, US). Intute, *McDaniel 10801* (MO). Near Iquitos, *McDaniel 11722* (MO). Río Ampiyacu, *Revilla 921* (MO). Pucallapa, *Soukup 3055* (F). Lower Río Nanay, *Williams 399* (F, US). Pinto–Cocha, *Williams 781* (F, US), *789* (F, US). Caballo to Cocha, *Williams 2035* (MO). Alto Rio Itaya, *Williams 3241* (F, US), *3262* (F). Iquitos, *Williams 3717* (F, US). Lower Río Huallaga, *Williams 4780* (F, US). SAN MARTIN: Tingo Maria, *Allard 22244* (US). Near Tarapoto, *Ferreyra 7775* (US). Above San José de Sisa, *Ferreyra 7916* (US). Río Huallaga Canyon, *Macbride 4250* (F, GH). Tarapoto, *McDaniel 13732* (MO). Puerto Pizana, *Schunke 6993* (MO). Sapososa, *Woytkowski 8349* (MO).

PUERTO RICO. Vic. of Mayagüez, *Britton & Marble 678* (F, NY, US). Near Maricao, *Britton et al. 4490* (F, GH, NY, US). Vic. of Arecibo, *Chase 6454* (US). Vic. of Cayey, *Chase 6734* (US), *6747* (US). Guavate, *Liogier 10418* (GH, IJ, NY, US). Maricao, *Sintensis 215* (GOET, NY, US). Near Larerx, *Sintensis 5918* (US). Luquillo Mts., *Wilson 350* (NY, US).

SURINAM. Sandrij Island, *Archer 2759* (US). Oelemani, *Boer 1158* (NY, UC). Vic. Moego, Cottica River, *Cowan 39007* (NY, US). Brokobaka, *Donselaar 3838* (A, F). Kalalebo, *Florschütz & Maas 2495* (US). Lucie Rivier, *Irwin et al. 55790A* (MO). Wilhelmine Gebergte, *Irwin et al. 57618* (MO, NY, UC, US). Coppername to Coronie, *Lanjouw & Lindeman 1384* (NY). Nassau, *Lanjouw & Lindeman 2146* (NY). 3 km N of Paramaribo, *Maguire & Stahel 22746* (A, F, NY). Pakka Pakka, Saramacca River, *Maguire 23965* (F, GH, MO, NY, RB, US). Tafelberg, *Maguire 24315* (NY). Montagne Ischoli–Epoyan, *Sastre 1460* (CAY). Wilhelmine Gebergte, *Stahel 621* (MO).

TOBAGO. Old Castara Rd., *Andrew 610A* (NY). Belmont Woods, *Broadway 3551* (F, ISC, MO, US). *Broadway 4038* (F, NY, US). Roxborough-Parlatuvier Rd., *Cowan 1410* (NY, US), *1486* (NY, US). Center of island, *Hitchcock 10261* (US), *10262* (US), *10269* (US), *10275* (US).

TRINIDAD. Caparo Woods, *Broadway 4923* (US). Tamana Forest, *Broadway 4952* (RB, US), *4959* (RB, US). Blanchisseuse Rd., *Broadway 5504* (A, MO). Aripo Rd., *Broadway 5892* (MO, US). Arouca, *Broadway 6811* (F, MO, US). Monga, *Broadway 7915* (US). Heights of Aripo, *Broadway 9929* (GH, NY, US). Morne Blue, *Britton et al. 2266* (GH, NY, US). Northern Range, *Davidse 2461* (MO). Between La Vache and

Maracas Bay, *Davidse 2566* (ISC, MO). Ca. 2 mi NE of Point Fortin, *Davidse 2579* (MO). Maraval, *Hart 5427* (M). Port of Spain, *Hitchcock 9962* (US). St. Joseph, *Hitchcock 10020* (US). Tabaquite, *Hitchcock 10120* (US). Cedros, *Hitchcock 10151* (US). Valencia-Matura Rd., *Soderstrom 1036* (US).

VENEZUELA. BOLÍVAR: Km 88, carretera El Dorado, *Aristeguieta 3712* (VEN). Cerro Uroi, *Maguire et al. 53806* (VEN). La Gran Sabana, *Tamayo 2786* (US, VEN).

VIRGIN ISLANDS. ST. CROIX: Bodkin Hill, *Fosberg & Ogden 55312* (MO). ST. THOMAS: *Britton & Marble 1230* (NY, US). TORTOLA: Sage Mtn., *Shafer 1147* (NY, US).

WINDWARD ISLANDS. GUADELOUPE: *Bertero s.n.* (P).

6. **Lasiacis linearis** Swallen, Phytologia 4: 427. 1953. TYPE: Guatemala, Zacapa, Sierra de las Minas, below Finca Alejandria, pine covered canyon bordering Río Lima, 2000 m, 14 Oct. 1939, *Steyermark 30046* (F, holotype).

Perennial; main culms creeping, decumbent, rooting at the nodes, only the ultimate portions erect, these commonly 40–100 cm tall, occasionally higher when supported in brush, the culms freely branching and forming large tangled colonies; internodes slender, 2–5 mm thick, solid, often purplish, usually glabrous, occasionally with a small line of puberulence, or the upper part puberulent; nodes glabrous; sheaths puberulent or pubescent with hairs to 0.7 mm long, the overlapping margin ciliate, with hairs to 0.5 mm long, rarely glabrous, sheaths mostly shorter than the internodes; ligule conspicuous, (1.4–)1.8–4.0(–4.8) mm long, tan to dark brown, the apex irregularly erose to lacerate, ciliate with hairs 1.5–3.0 mm long, puberulent to short pubescent on the back; collar densely puberulent throughout, rarely only on the margin; blades 13–22 cm long, 0.8–1.5(–1.18) cm wide, the base slightly asymmetrical, the apex acuminate to attenuate, the upper surface usually glabrous and often scabrid, occasionally short pubescent especially toward the base, the lower surface usually glabrous, occasionally sparsely puberulent especially along the midrib, the margins scabrid; panicles 19–30 cm long, the longest branch 10–23 cm long, the branches scabrid, widely spreading, naked at least for the lower half, bearing long-pedicelled spikelets toward the ends of the branches, the pulvini glabrous, the lower ones often puberulent with a few short hairs; spikelets narrow, obovate, 3.9–4.5 mm long, 2.2 mm wide, often purplish when immature; first glume 2.0–2.5 mm long, 7–9-nerved; second glume 8–11-nerved; sterile floret without a flower, the lemma 9–11-nerved, the palea usually ⅓ to ½ or rarely ⅔ as long as the fertile floret, occasionally absent; fertile floret 3.9–4.1 mm long, 2.0–2.4 mm wide, the anthers white, the stigmas purple; caryopsis 2.2–2.4 mm long, 1.6–1.8 mm wide; chromosome number $n = 18$.

Ecology: *Lasiacis linearis* typically inhabits cloud forests although it may often extend down into the oak-pine and pine communities which commonly occur below cloud forests in northern Central America. It may often be found in fairly undisturbed sites, especially in the pine forests. In the cloud forests, it is usually more common in habitats where some disturbance has taken place, such as along trails, in partially logged areas, in open areas created by downed trees, and along forest edges. The species has been collected in the mountains from 1,400 to 2,400 m. Spikelet-bearing plants have been collected in June, July, and October through March.

Distribution: *Lasiacis linearis* is an infrequent species extending from Chiapas, Mexico, to eastern Panama. I have seen no collections from Belize, El Salvador, and Nicaragua.

Lasiacis linearis is characterized by its procumbent growth habit, solid culms, long narrow blades, prominent ligules, and the diffuse panicles with few, solitary, long-pedicelled spikelets. Occasional specimens do not have completely solid culms. I have seen four collections in which this is true, *Davidse & Pohl 2121*, *Morton 6954*, and *Standley 23126* from Honduras and *Williams et al. 26097* from Guatemala. Some culms in these collections may be completely solid whereas in others the pith may be partly missing. In all cases, however, one can see some definite pith remains or partial cores. The brown appearance of the pith in some specimens suggests that some of the destruction may be due to fungal growth, and in others, insect destruction seems probable.

Lasiacis linearis is most closely related to *L. oaxacensis* and is probably a montane-forest derivative of the latter. The two are much alike in growth form and gross morphology, but *L. oaxacensis* is generally more robust in all respects. In Central America, where the two species are sympatric, they can best be distinguished by the glabrous sheaths and by the clustering of the spikelets in pairs or small groups toward the tips of the panicle branches in *L. oaxacensis* and in the lack of staminate flowers in the sterile floret of *L. linearis*.

Lasiacis linearis has often been identified as *L. lucida*. The type of *L. lucida*, however, belongs with *L. standleyi* which has hollow culms and a more densely flowered panicle than *L. linearis*.

Lasiacis linearis was long known only from the type collection in Guatemala (Swallen, 1955a). Recent collections have extended the range of this species throughout most of Central America, with the exceptions of Belize, El Salvador, and Nicaragua. It is almost certain to be found in Nicaragua, a country which for the most part is the most poorly collected area in Central America. Whether it occurs in Belize and El Salvador is more problematical. In El Salvador it should be looked for in the northern part of the county.

Common name: Panama: Chiriqui, bambito, *Tyson 5666*.

COSTA RICA. ALAJUELA: La Brisa de Zarcero, *Smith H978* (F). SAN JOSÉ: 2 km from San Gabriel, *Pohl & Davidse 11049* (ISC).

GUATEMALA. EL PROGRESO: Sierra de las Minas, *Steyermark 43405* (F, US). GUATEMALA: Vic. of San Andrecillo, *Molina & Molina 27555* (MO). QUINCHÉ: 2.5 mi N of Nebaj, *Proctor 25497* (IJ). S of Chichicastenango, *Standley 62422* (F). SAN MARCOS: Near Aldea Fraternidad, *Williams et al. 26097* (F, GH, NY, US). SOLOLÁ: Volcán Atitlán, *Steyermark 47347* (F, US). ZACAPA: Sierra de las Minas, *Steyermark 30046* (F), *42496* (F, US).

HONDURAS. EL PARAÍSO: Güinope, *Rodríguez 1760* (F). MORAZÁN: Cerro Uyuca, *Davidse & Pohl 2100* (ISC, MO), *2106* (ISC, MO). Cerro La Tigre, *Davidse & Pohl 2121* (ISC, MO). Cerro Uyuca, *Glassman 1625* (F, NY). Mt. San Juancito, *Glassman 1972* (NY, UC). Cerro La Tigre, *Hawkes et al. 2131* (F, US). Cerro Uyuca, *Molina 205* (F, GH, US); *Morton 6954* (F, NY, US); *Pohl 12490* (ISC); *Standley & Williams 690* (F); *Standley 4798* (F), *23126* (F, GH, NY, UC, US), *28282* (F, GH); *Swallen 10900* (US), *11057* (US). Mt. San Juancito, *Swallen 11138* (US). Cerro Uyuca, *Williams & Molina 12112* (US).

MEXICO. CHIAPAS: Sierra Madre, *Tateoka 1031* (US).

PANAMA. CHIRIQUÍ: Cerro Azul, *Croat 26858* (MO). Volcán de Chiriquí, *Davidse & D'Arcy 10162* (MO); *Hitchcock 8201* (US). Ca. 2 mi W of Cerro Punta, *McDaniel 10048* (MO). Monte Lirio, *Seibert 278* (GH, MO, NY, US). 1 mi SW of Cerro Punta, *Tyson 5666* (MO). Cerro Punta, *Tyson 5802* (MO, SCZ). Near El Volcán, *White 218* (MO).

7. **Lasiacis nigra** Davidse, Phytologia 29: 152. 1974. TYPE: Costa Rica, Alajuela, 3 km N of Palmares along the Carretera Interamericana, 800 m, edge of coffee plantation, culms 8 m tall, hanging from trees, 22 Oct. 1968, *Pohl & Davidse 11272* (ISC, holotype; CR, EAP, K, MO, US, isotypes).

Panicum divaricatum L. var. *molle* Schlecht. & Cham., Linnea 6: 33. 1831. TYPE: not indicated.

Perennial; culms, casepitose, erect at the base, arching above and clambering into vegetation, 1–8 m long; internodes to 10 mm thick, lignified, glabrous, with a line of puberulence, papillose-puberulent, or densely papillose-pubescent, hollow; nodes glabrous; sheaths pilose or varying to completely glabrous, the margin cilate with hairs to 3.0 mm long, the auricular hairs to 4.0 mm long; collar pilose, puberulent, or glabrous; ligule 0.5–1.3(–2.0) mm long, usually whitish and glabrous or occasionally darker and pubescent on the back, the apex glabrous or ciliate with hairs to 1.5 mm long; blades linear to lanceolate, 5–11(–15) cm long, (0.3–)0.6–1.8(–2.6) cm wide, commonly pilose, also puberulent, pubescent, or completely glabrous, the base asymmetrical, slightly lobed and clasping the culm, the margin scabrid, the apex acuminate; panicles (2–)5–12(–19) cm long, the longest branch 1–8(–11) cm long, bearing few, long-pedicelled spikelets, the branches ascending to diverging, branches pilose to glabrous, the pulvini pilose to glabrous, the pedicels widely spreading at maturity; spikelets large, obovate, (3.6–)4.0–5.0(–5.5) mm long, often purple when immature; first glume (1.6–)2.0–2.7(–3.2) mm long, 5–13-nerved; second glume 7–13-nerved; sterile floret with or without a staminate flower, the anthers rudimentary or 2.3–2.7 mm long, the lemma 9–11-nerved, the palea ½ to subequal the length of the fertile floret; fertile floret 3.8–4.6 mm long, 2.5–2.9 mm wide, brown, the anthers 2.1–2.8 mm long, white, the stigmas white; caryopsis 2.4–2.7 mm long, 1.9–2.4 mm wide, light brown; chromosome number $n = 18$.

Ecology: *Lasiacis nigra* is a montane species primarily found along forest edges, in roadside thickets, and among similar secondary woody vegetation. It is found as a component of deciduous forests, pine-oak forest, and montane broadleaf forests. Most elevation records are between 900 to 2,300 m. A few collections from South America have been reported from subalpine páramo vegetation at 2,600 m in the Andes, the highest elevation record for any *Lasiacis* species. Spikelet-bearing plants have been collected throughout the year but most commonly from June to January.

Distribution: *Lasiacis nigra* extends from southern Nuevo León and Tamaulipas in Mexico south throughout Central America. In northwestern South America, it occurs in Colombia, Venezuela, Ecuador, and Peru.

Hitchcock (1920) interpreted *L. sorghoidea* very broadly, including under it *L. sorghoidea* var. *sorghoidea* and *L. nigra* of my treatment. At the same time, he raised the possibility that more than one taxon should be recognized.

I believe that two species are included under *L. sorghoidea* sensu Hitchcock, namely *L. nigra* and *L. sorghoidea*. *Lasiacis nigra* is more delicate and scandent that *L. sorghoidea*; it has smaller leaves and inflorences but usually larger spikelets; and its inflorescence bears relatively few, large, long-pedicelled spikelets

giving it an open appearance. *Lasiacis sorghoidea*, on the other hand, typically has large, moderately dense inflorescences with many small spikelets on short pedicels. The most common type of leaf pubescence pattern in *L. sorghoidea* is one in which the sheaths are papillose-hispid, the collar is densely hispid, the lower blade surface is velutinous, and the upper blade surface is puberulent or hispidulous. This pattern is rarely encountered in *L. nigra* in which pubescence varies from nearly completely glabrous to densely pilose.

Even with the exclusion of *L. sorghoidea*, *L. nigra* still remains morphologically variable. I have not chosen to give formal taxonomic recognition to any variants, but further study may show the desirability of doing so. Some of the major features of variation are discussed below.

Included in *L. nigra* are plants with relatively long, narrow leaves, usually glabrous or nearly so, but at times pubescent. These generally bear spikelets approaching the largest size in *L. nigra*. They are concentrated in South America and Mexico. Many of the South American specimens have been identified as *L. leptostachya* (=*L. divaricata* var. *leptostachya*) in recent years. However, the long-pedicelled, widely spreading spikelets distinguish these plants readily from that strictly Central American and Mexican variety of *L. divaricata*. Another form, especially common in Central America but known from throughout the range, is one with relatively broader and shorter pilose leaves and relatively large spikelets. A third common form is one which may have pubescent or nearly glabrous leaves, often with just a few large hairs along the midrib. The spikelets may be small or large and leaf size tends to be intermediate between that of the previous two forms. The small-spikelet specimens of this third form are some of the most puzzling in the genus. They have often been identified as *L. divaricata* var. *divaricata* but are closer to *L. sorghoidea* and *L. divaricata* var. *austroamericana*. *Lasiacais divaricata* var. *divaricata* can most easily be distinguished on the basis of its divergent panicle branches and larger spikelets. *Lasiacis sorghoidea* can best be distinguished by the usually less densely arranged spikelets and larger blades. From *L. divaricata* var. *austroamericana* these specimens differ in their pubescence. Admittedly the distinctions become rather arbitrary. But the number of specimens is relatively small, and since they are mostly from higher elevations, it seems most appropriate to include them with *L. nigra*. Representative specimens are listed separately after the more typical collections of *L. nigra*.

Lasiacis nigra probably represents the same taxon as *L. divaricatum* var. *molle*. Both the two-word description (villoso-pubescens) and the geographical location where these plants were collected (Veracruz to Jalapa) indicate that var. *molle* may be the same as *L. nigra*. However, I have not seen the type, which is presumably located at Halle (HAL) (Stafleu, 1967).

BELIZE. CAYO: *Lundell 6434* (F, GH, NY, US). San Augustin, *Lundell 6752* (F, GH, NY, US).

COLOMBIA. ANTIOQUIA: Bello, *Archer 174* (US). Vic. of Medellín, *Archer 374* (US). Granja de las Mercedes en Venecia, *Barkley & Gutiérrez 1651* (US); *Barkley et al. 17C448* (US). W of Frontino, *Core 477* (US). Laguna de Guarne, *Daniel 2770* (US). Caldas, *Gärtner 38* (US). Vic. of Medellín, *Jaimes 9* (US); *Molina & Barkley 19An076* (F, US), *19An078* (US), *19An079* (F, US). Caldas, *Rodríguez 19* (US). Vic. of Medellín, *Toro 833* (NY); *Varela 17* (US). CALDAS: Salento, *Killip & Hazen 8770* (GH, NY, US). CAUCA: Between Rosale and

Bolívar, *Core 124* (US). Popoyán, *Cuatrecasas & Arbeláez 6080* (F, US). Tacueyó, *Cuatrecasas 19377* (F, GH, US). El Paraíso, *Dryander 2056* (UC, US). 5 km E of Timbío, *Grant & Drew 10667* (US). Río Sucio, *Pennell & Killip 7223* (NY, US), *7227* (US). Cuesta de Tocatá, *Pittier 685* (US). Miraflores, *Pittier 886* (US). El Tambo, *Sneidern 164* (GH, US). CUNDINAMARCA: La Hondonada, *Cuatrecasas 221* (F, US). Sasaima, *García-Barriga 12598* (US). Vic. of Bogotá, *Grubb et al. 843* (US). Fusagasuga, *Juzepczuk 5280* (US). Cagueza, *Karsten s.n.* (GOET, US). Fusagasuga, *Koie 5237* (US). HUILA: 23 km ENE of Colombia, *Fosberg 19635* (US). 15 km ENE of Colombia, *Fosberg 19649* (US). Between Acevedo and Suaza, *Little 8556* (US). E of Neiva, *Rusby & Pennell 861* (GH, MO, NY, US), *1001* (NY, US). MAGDALENA: SE of Donachuí, *Cuatrecasas & Romero-Castañeda 24325* (US). E of Manuure, *Cuatrecasas & Romero-Castañeda 25306* (US). Sierra de Santa Marta, *Kirkbride 2302* (MO), *2446* (MO). Alrededores de San Andrés, *Romero-Castañeda 6974* (MO). NARIÑO: Pasto, *Alston 8292* (US). Vic. of Samaniego, *Fernández & Mora 1188* (NY). 22 km E of Pasto, *Fosberg 20532* (US). Between Cartago and La Unión, *Mora 2407* (US). SANTANDER: Above Suratá, *Killip & Smith 16554* (US). Vic. of California, *Killip & Smith 17013* (GH, NY, US), *17690* (GH, US). TOLIMA: Libano, *Pennell 3415* (MO). VALLE: El Cairo, *Cuatrecasas 13884* (F). Between San Antonio and Mares, *Cuatrecasas 15202* (F, UC, US). Naranjal, *Cuatrecasas 15358* (F, US). La Tulia, *Cuatrecasas 18532* (US), *18572* (F). Between Brisas and Alban, *Cuatrecasas 22174* (F, US). Las Nieves, *Dryander 1895* (US). Dugua, *Killip 5444* (GH, NY, US). La Cumbre, *Killip 5680* (GH, NY, US); *Killip & Hazen 11117* (GH, NY, US). El Silencio, *Killip & García 33793* (US). La Cumbre, *Pennell 5025* (GH, NY, US). Cartago, *Rojas 4* (US).

COSTA RICA. ALAJUELA: La Palma de San Ramón, *Brenes 5147* (F, US), *5161* (US), *5191* (F, NY). Santiago near San Ramón, *Brenes 14375* (GH). La Palma de Ramón, *Brenes 15059* (F, NY). Vic. of San Ramón, *Brenes 17025* (F). Carillos de Poás, *Brenes 19413* (F, NY). Vic. of San Ramón, *Brenes 20314* (F, NY), *20507* (F). San Miguel de San Ramón, *Brenes 21952* (F). Cocao de Alajuela, *Brenes s.n.* (NY). La Palma, *Maxon & Harvey 7998* (GH, NY, US), *8025* (US), *8050* (US). 6.5 km W of Vara Blanca, *Pohl & Calderón 10280* (ISC). Volcán Poás, *Pohl & Davidse 11174* (ISC). 1 km S of Ciudad Quesada, *Pohl & Davidse 11250* (ISC). 3 km N of Palmares, *Pohn & Davidse 11272* (ISC). 10 km N of San Ramón, *Pohl & Davidse 11275* (ISC). La Palma de San Ramón, *Pohl & Davidse 11371* (ISC). Guadeloupe de Zarcero, *Smith A371* (F, MO). Region of Zarcero, *Smith A430* (MO). San Luis de Zarcero, *Smith H1015* (F, MO, NY). Vic. of Fraijanes, *Standley & Torres 4705* (US). La Palma, *Stork C423* (UC). Santa Clara, *Stork 2577* (US). CARTAGO: Vic. of Cartago, *Brenes 10423* (US); *Cooper 98* (US). Cervantes, *Carpenter 662* (US). Vic. of Tablazo, *Durkee 75-60* (MO). 3 km E of Cachí, *Lent 1736* (F, NY). Vic. of Santiago, *Maxon 128* (NY, US). Moravia de Chirripó, *Pohl & Davidse 10870* (ISC). 10 km SW of Tejar, *Pohl & Davidse 11134* (ISC). 9 mi S of Purasil, *Pohl & Davidse 11198* (ISC). 3 km W of Grano de Oro, *Pohl & Davidse 11477* (ISC). Platanillo, *Smith 3019* (ISC). Vic. of Cartago, *Standley 33365* (NY, US). El Muñeco, *Standley 33581* (US). La Estrella, *Standley 39215* (GH, US). Vic. of Orosí, *Standley 39648* (US). Río Ventado, *Standley & Valerio 49448* (US). 3 km from Tejar, *Taylor & Taylor 11866* (MO). Alto de Ochomogo, *Williams & Molina 13821* (F, GH, MO). HEREDIA: Río Virilla, *Allen 591* (F, GH, MO). 5 km NE of Vara Blanca, *Davidse 892* (NY). Río Vueltas, *Gómez 2290* (F). Vara Blanca, *Skutch 3148*. LIMÓN: 19 mi below IICA, *Pohl & Calderón 10310* (ISC). PUNTARENAS: E of Monteverde, *Burger & Baker 9578* (MO). Between Buenos Aires and Cerro Pittier, *Hatheway 1689* (US). Cañas Gordas, *Pohl & Davidse 11166* (ISC). Hatillo, *Rojas 46* (F). San Vito de Java, *Smith 2938* (ISC). SAN JOSÉ: Río Tirribí, *Alfara 33989* (GH, US). San Fernando de Guadeloupe, *Canossa s.n.* (F). Vic. of San José, *Hitchcock 8451* (US); *Pittier 81A* (US). 10 km NE of San Isidro del General, *Pohl & Calderón 10048* (ISC). 4 mi S of División, *Pohl & Davidse 10070* (ISC). Between Aserrí and Tarbaca, *Pohl & Calderón 10388* (ISC). 7 km S of Aserrí, *Pohl & Davidse 11041* (ISC). 2 km NNE of San Gabriel, *Pohl & Davidse 11050* (ISC). 1 km E of Frailes, *Pohl & Davidse 11071* (ISC). Below La Hondura, *Pohl & Davidse 11214* (ISC). S of San Antonio, *Pohl & Davidse 11351* (ISC). 0.5 km SE of Barbacoas, *Pohl & Davidse 11403* (ISC). 7 km S of Aserrí, *Riggins 606* (ISC). La Hondura, *Smith 2843* (ISC). Vic. of San José, *Standley 38998* (US). Between San Pedro Montes de Oca and Curridabat, *Standley 41296* (US). Between Aserrí and Tarbaca, *Standley 41350* (GH, US). Vic. of Santa Maria de Dota, *Standley 41665* (US); *Standley & Valerio 43476* (US). Vic. of San José, *Standley 47324* (GH, US), *47328* (GH, US). Uruca, *Tonduz 7207* (F, GH, US). Between San José and Zapote, *Tonduz 7234* (F, GH, US).

ECUADOR. AZUAY: Río Noray, *Steyermark 52868* (F, US). IMBABURA: El Achiotal,

Solís 12337 (F). NAPO: Between Puyo and Canelos, *Mexia 6850* (UC, US). Puyo, *Skutch 4397* (A, F, MO, NY, US). ORO: Between La Chorita and Portovelo, *Hitchcock 21180* (US), *21184* (US). PICHINCHA: Chiriboga, *Asplund 8669* (US). Santo Domingo de los Colorados, *Fagerlind & Wibom 1961* (MO). Tandayapa, *Solís 17008* (US). Santa Domingo de los Colorados, *Solís 10895* (F). SANTIAGO ZAMORA: 18 km NE of Loja, *Fosberg 23149* (US). TUNGURAGUA: Between Baños and Cashurco, *Hitchcock 21856* (US). El Topó, *Solís 10281* (F).

EL SALVADOR. AHUACHAPÁN: Near Ataco, *Standley & Padilla 2720* (F). Vic. of Ahuachapán, *Standley & Padilla 2759* (F), *2985* (F). Vic. of Apaneca, *Standley & Padilla 2992* (F). LA LIBERTAD: Volcán San Salvador, *Davidse & Pohl 2025* (ISC, MO); *Hitchcock 8925* (US), *8951* (US), *8952* (US); *Pohl & Davidse 11831* (ISC, MO); *Pohl & Gabel 13661* (MO); *Williams & Molina 15100* (US), *15126* (US). MORAZÁN: Montes de Cacaquatique, *Tucker 693* (F, ISC, NY, UC, US), *733* (F, ISC, UC, US). SAN VICENTE: Volcán San Vicente, *Standley 21508* (GH, US). SANTA ANA: 7 mi NE of Metapán, *Croat 42290* (MO). E side of Lago de Coatepeque, *Davidse & Pohl 2035* (ISC, MO). Cerro Verde, *Pohl & Gabel 13594* (MO). Massif Monte Cristo, *Weberling 597* (M). Volcán de Santa Ana, *Weberling 1991* (M).

GUATEMALA. ALTA VERAPAZ: 10 km S of Cobán, *Harmon & Dwyer 4278* (MO). 5 km NE of Cobán, *Molina & Molina 11987* (US). Near Cobán, *Muenscher 12225* (US); *Standley 69153* (F), *69448* (F, US). 43 km NE of Cobán, *Standley 70182* (F). Between Cobán and Tres Cruces, *Standley 90259* (F). BAJA VERAPAZ: 16 mi from Salamá, *Hawkes et al. 1921* (F). CHIMALTENANGO: Chimaltenango to San Martin Jilotepeque, *Standley 57903* (F, NY, US), *80893* (F). Río Guacalate, *Standley 81040* (F). EL PROGRESO: 8 km S of El Progreso, *Iltis G-73* (WIS). Around Barranquillo, *Steyermark 46406* (F, US). ESCUINTLA: Volcán de Fuego, *Standley 64544* (F). GUATEMALA: Finca la Aurora, *Aguilar 31* (F). 7 mi E of Guatemala, *Harmon 2935* (MO). Guatemala, *Hitchcock 9057* (US), *9101* (US); *Kellerman 4735* (US). 20 km E of Guatemala, *Molina 13493* (US). Río Villalobos, *Molina 16067* (F, GH, NY). Between San Lucas and Guatemala, *Molina 21108* (F, NY). Amatitlán, *Ruano 843* (F). Guatemala, *Standley 59518* (F). Amatitlán, *Standley 61266* (F), *61411* (F). 10 km S of San Raimundo, *Standley 62898* (US), *62918* (US). HUEHUETENANGO: Nentón, *Seler 2858* (GH). Naxacranal, *Seler 3004* (F, GH, US). 13 km W of Huehuetenango, *Standley 81531* (F). Between Mimanhuitz and Yulhuitz, *Steyermark 48627* (US). 10 km W of Huehuetenango, *Williams et al. 22295* (F, US). JALAPA: Vic. of Jalapa, *Standley 76445* (F). Between Jalapa and Paraíso, *Standley 77336* (F). QUETZALTENANGO: Near Zunil, *Skutch 986* (A, F, ISC, US). Near Santa Maria de Jesús, *Standley 67263* (F, UC), *68268* (F, US), *84840* (F, US), *86807* (F, NY), *87004* (F, UC), *87067* (F). Between Colomba and Las Mercedes, *Standley 87968* (F, US). Near Santa Maria de Jesús, *Steyermark 33767* (F). Near Zunil, *Williams et al. 22982* (F, US), *23032* (F, NY, US). SACATEPÉQUEZ: Vic. of Santa Maria de Jesús, *Hunnewell 17090* (GH). Near Las Lajas, *Standley 58102* (F, US). Vic. of Antigua, *Standley 58590* (F, GH, US). Cuesta de las Cañas, *Standley 58962* (F, US). Vic. of Santa Maria de Jesús, *Standley 59365* (F). Above Pastores, *Standley 60762* (F). Vic. of Antigua, *Standley 61205* (F, US). Above Dueñas, *Standley 63194* (F, MO, NY). SAN MARCOS: Volcán Tajumulco, *Steyermark 37137* (F, US). SANTA ROSA: E of Cuilapa, *Standley 78219* (F). Volcán de Tecuamburro, *Standley 78566* (F). SOLOLÁ: Volcán Atitlán, *Steyermark 47982* (F, US). ZACAPA: Sierra de las Minas, *Steyermark 29987A* (F). Monte Virgen, *Steyermark 42592* (F), *42603* (F, US).

HONDURAS. CHOLUTECA: Vic. of San Marcos de Colón, *Standley 15960* (F). COMAYAGUA: Siguatepeque, *Hazlett 649* (MO). Valibrea, *Rodríguez 2754* (F). Trincheras, *Williams & Molina 12538* (F, GH), *14661* (F, GH, MO, US). 20 km N of Siguatepeque, *Williams & Williams 18425* (GH, ISC). COPÁN: 5 km SE of Santa Rosa de Copán, *Molina 11667* (US). CORTES: Mont. La Cumbre, *Molina 10566* (US). N side of Lago Yojoa, *Morton 7633* (US). DISTRITO CENTRAL: Llamapa, *Pohl & Gabel 13525* (MO). EL PARAÍSO: Mt. Yuscaran, *Molina 620* (F, GH, MO, US). 7 km NW of San Lucas, *Pohl & Davidse 12161* (MO). Güinope, *Rodríguez 1761* (F). INTIBUCA: Vic. of La Esperanza and Intibuca, *Standley 25266* (F). MORAZÁN: Mt. Uyuca, *Davidse & Pohl 2098* (ISC, MO). 10 km NE of Tegucigalpa, *Davidse & Pohl 2119* (ISC). Between San Juancito and Valle de Angeles, *Davidse & Pohl 2126* (ISC, MO). Vic. of El Zamorano, *Freytag 224* (MO), *319* (MO). Mt. Uyuca, *Glassman 1947* (NY, WIS); *Molina 1432* (F, GH, US). 20 km S of Tegucigalpa, *Molina 18494* (F, GH, NY). Mt. Uyuca, *Standley 14063* (F), *20591* (F), *23103* (F, GH, MO, UC, US). El Jicarito, *Standley 26837* (F, GH, US). Mt. Uyuca, *Swallen 10904* (US). San Antonio de Oriente, *Swallen 10973* (US). Mt. Uyuca, *Williams & Molina 10722* (F, GH, MEXU, MO),

12113 (US). SANTA BARBARA: Near El Mochito, *Davidse & Pohl 2209* (ISC, MO). Above El Sauce, *Williams & Molina 14517* (F, GH, US).

MEXICO. CHIAPAS: Km 1134, Pan American Hwy., *Baldwin 14342* (US). Ala Shashib River, *Breedlove 6428* (F). La Trinitaria, *Breedlove 10056* (F, MEXU). Kulak'tik, Tenejapa, *Breedlove 10971* (F, MEXU). 17 mi E of La Trinitaria, *Breedlove 11322* (F). Zinacantán, *Breedlove 11827* (MEXU). 3 mi S of Aguacatenango, *Breedlove & Raven 13121* (NY). 19 km N of Ocozocoautla, *Breedlove 13956* (UC). 6–8 km N of Berriozábal, *Breedlove 20352* (MO). 18–20 km N of Ocozocoautla, *Breedlove & Thorne 21064* (MO). 13 km N of Berriozábal, *Breedlove 26303* (MO). Above El Chorreadero, *Breedlove 26857* (MO). 16 km NW of Rizo de Oro, *Breedlove 27616* (MO). 10 km SW of Ocosingo, *Breedlove 27859* (MO). 6–8 km N of Ocosingo, *Breedlove 27985* (MO). 18–20 km N of Ocozocoautla, *Breedlove 28156* (MO). 30 km NW of Ocozocoautla, *Breedlove 28907* (MO). 20 km S of Ocozocoautla, *Breedlove 29088* (MO). Above Talquian, *Breedlove 29477* (MO). 3 km E of Francisco Madero, *Breedlove 36679* (MO). 5 km W of Rizo de Oro, *Breedlove 36704* (MO). 3 km E of Francisco Madero, *Breedlove 38046* (MO). 14 km N of Tuxtla Gutiérrez, *Brunken & Perino 328* (MO). 30 km W of San Cristóbal, *Brunken & Perino 348* (MO). 36 km W of Tuxtla Gutiérrez, *Davidse & Davidse 9471* (MO). N of Tuxtla Gutiérrez, *Fassett 29100* (US). Zinacantán, *Laughlin 1218* (NY), *2094* (WIS), *2289* (F). Mt. Ovando, *Matuda 3987* (GH, MEXU, MO, NY). Zacatonal, *Matuda 18327* (MEXU, US). Berriozábal, *Miranda 6475* (US). 15 mi S of Comitán, *Reeder & Reeder 2094* (GH). 20 mi E of Chiapa de Corzo, *Reeder & Reeder 2127* (US). Near Mastepec, *Tateoka 1003* (US). N of Tuxtla Gutiérrez, *Tateoka 1004* (US). 125 km NE of Tuxtla Gutiérrez, *Tillett 636-57* (US). Mahosik, Tenejapa, *Ton 1133* (NY). Tih Ha', Tenejapa, *Ton 1446* (F, NY). Oshewits, Tenejapa, *Ton 1582* (NY). Between Escuipulas and Canada Honda, *Xolocotzi X-331* (US). Near El Triumfo, *Xolocotzi X-459* (US). GUANAJUATO: 2–4 km E of Guanajuato, *Sohns 286* (US). GUERRERO: Acapulco, *Cantú 16* (MEXU). Mancho Mina, *Hinton 9581* (MO, NY). Chilacayote-Mangito, Mina, *Hinton 14932* (GH, NY, US). W of Chilpancingo, *Sharp 441400* (MEXU, US). HIDALGO: Molango, *Moore 1951* (US). Between Pachuca and Zacualtipán, *Moore & Wood 4235* (US). Puerto del Zopilote, *Moore 5076* (GH, UC, US). JALISCO: San Nicolás, *Hitchcock 7207* (US). Guadalajara, *Hitchcock 7348* (US); *Jones 27614* (MO, NY, UC). Near El Molino, *McVaugh 13306* (US). 9 mi S of Autlán, *McVaugh 14232* (MEXU, US). 20 mi N of Tepatitlán, *McVaugh 17363* (NY, US). Barranca Ibarra, *Reko 4561* (MEXU), *4563* (MEXU). El Molino, *Rzedowski 14254* (US). MÉXICO: Near Villa Guerrero, *Alexander & Hernández 1908* (NY). Temascaltepec, *Hinton 1909* (GH, NY, US). Tejupilco, *Hinton 4958* (MEXU, NY). Temascaltepec, *Hinton 6722* (ISC, MO, NY, US); *Matuda 26610* (MEXU, US). Jilotepec, *Matuda 26752* (MEXU). Ixtapan de la Sal, *Matuda 27046* (MEXU). 9 km N of Ixtapan, *Roe & Roe 1853* (MEXU, WIS). 2 km N of Ixtapan, *Roe & Roe 1903* (MEXU, WIS). MICHOCÁN: Vic. of Morelia, *Arsène 2703* (P), *2976* (MO, US), *5287* (MO, US), *6096* (P), *8487* (MO, US), *8700* (US). 1.2 mi E of Tuxpan, *Brunken & Perino 440* (MO). Ca. 1.7 mi NW of Tuxpan, *Davidse & Davidse 9819* (MO). Apatzingan, *Hinton 15156* (GH, NY, US). 22 km S of Uruapan, *King & Soderstrom 4813* (MEXU, NY, UC, US). 1 km below Tacambaro, *Moore et al. 5598* (GH, UC, US). MORELOS: Near Guernavaca, *Leavenworth & Leavenworth 927* (F, MO). Teposteco, *Lyonnet 1373* (US), *2541* (US). Near Guernavaca, *Lyonnet 2827* (US); *Pringle 5960* (ISC, MEXU, US), *6663* (F, GH, GOET, ISC, M, MO, NY, P, UC, US). Near Tepoztlan, *Seler 4292* (GH, US). NAYARIT: 10 km S of Compostela, *Rzedowski 14359* (MEXU). NUEVO LEÓN: Between Potrero Redondo and Las Ajuntas, *Muller 2961* (F, GH, MO, UC, US). OAXACA: 15 km WSW of Oaxaca, *Camp 2461* (MO, NY). Ca. 10 km NE of Oaxaca, *Conrad & Conrad 3064* (MO). Cerro San Antonio, *Conzatti 1596* (F). San Pablo Heintzo, *Conzatti 2012* (F, MEXU, US). Vic. of Oaxaca, *Kenoyer 1547* (GH). Tomellin Canyon, *Pringle 6701* (F, GH, GOET, ISC, M, MEXU, MO, NY, P, UC, US). Cafetal Montecristo, *Reko 3474* (MEXU, US). PUEBLA: La Mesa Necaxa, *Miranda 4125* (MEXU). Hacienda de Noria, *Nicolás s.n.* (P). El Cerro de Chuhuatepetl, *Santos 3347* (US). Between Puebla and Atlixco, *Sharp 44943* (MEXU, US). SAN LUIS POTOSÍ: 34 mi E of San Luis Potosí, *Johnston & Crutchfield 6028* (US). Las Canoas, *Pringle 3808* (F, GH, GOET, ISC, MEXU, MO, NY, P, UC, US). Minas de San Rafael, *Purpus 5439* (UC, US). 41 mi E of San Luis Potosí, *Reeder & Reeder 4765* (US). 13 km W of Santa Catarina, *Roe & Roe 2207* (MEXU, WIS). Sierra de Alvarez, *Sohns 1198* (US). Sierra de Guadalcazar, *Sohns 1378* (US). Sierra de Alvarez, *Sohns 1390* (US). To Xilitla, *Sohns 1437* (US). TAMAULIPAS: 22 km SE of Miquihuana, *Stanford et al. 870* (GH, MO, NY). To Piña Nevada, *Stanford et al. 2502* (US). VERACRUZ: Orizaba, *Balls B4294* (UC, US). Coapepec, *Baldwin 14270* (US). 15 mi SE of Xalapa, *Barkley et al. 2594* (F), *2597*

(F). Jalapa, *Beetle M-2216* (MO, WIS). 3 km SW of Orizaba, *Croat 39510* (MO). Córdoba, *Fisher 35298* (F, MO, NY); *Hitchcock A.G.N.H.409* (F, GH, MO, NY, UC, US). Orizaba, *Hitchcock A.G.N.H.415* (F, GH, MO, NY, US), *6389* (US). Córdoba, *Hitchcock 6393* (US), *6442* (US), *6445* (US), *6458* (US). Jalapa, *Hitchcock 6642* (US), *6674* (NY, US), *6680* (US). Near Mirador, *Hohenacker 9* (GOET), *9a* (GOET, P), *9c* (GOET). El Plan de Las Hayas, *Lot 444* (GH). Jalapa, *MacDaniels 857* (F). Zacuapan, *Purpus 3779* (F, GH, NY, US), *6205* (UC, US). Cerro Macuiltepec, *Reeder & Reeder 5984* (MO). Jalapa, *Rose & Hay 6144* (MEXU, NY, US). Near San Martin, *Rozynski 589* (F, NY). 30 km NW of Zongolica, *Santos 3076* (NY, US). Orizaba, *Seaton 393* (F, GH, NY, US). Near Río Blanco, *Sharp 44885* (MEXU, US). Orizaba, *Smith 581* (US). 5 km N of Jalapa, *Weaver 908* (UC).

NICARAGUA. CARAZO: Jinotepe, *Hitchcock 8865* (US). JINOTEGA: La Bastilla, *Seymour 2120* (F, GH, MO). Cerro Sialci, *Standley 10467* (F). MANAGUA: El Crucero, *Atwood & Neill 6753* (MO). Sierra de Managua, *Garnier A-1243* (F, GH, US), *1533* (GH), *1549* (GH, US); *Maxon et al. 7514* (GH, US). Ca. 5.4 km NE of El Crucero, *Stevens 5810* (MO). MATAGALPA: Between Matagalpa and Jinotega, *Williams et al. 23316* (F, NY, US), *23340* (F, NY, US). 6 km NE of Matagalpa, *Williams et al. 24032* (F, NY, US).

PANAMA. CHIRIQUÍ: Boquete, *D'Arcy 9849* (MO). E slope of Volcán Chiriquí, *Davidse & D'Arcy 10155* (MO). Vic. of Boquete, *Davidson 710* (F, GH, MO, US). Between Boquete and Cerro Horquete, *Duke A13704* (MO, UC). Vic. of Boquete, *Hitchcock 8269* (US), *8270* (GH, NY, US), *8282* (US), *8286* (US), *8311* (US), *8315* (US); *Killip 4544* (US); *Lewis et al. 569* (F, GH, MO, NY, UC, US). Cerro Vaca, *Pittier 5331* (GH, NY, US). COCLÉ: 5 mi W of El Valle, *Hammel 1765* (MO). PANAMÁ: Cerro Campana, *Duke 8698* (MO).

VENEZUELA. ARAGUA: Rancho Grande, *Davidse 3033* (ISC, MO). Alto de Choroní, *Davidse 3100* (ISC, MO). Vic. of Colonia Tovar, *Fendler 1619* (GH, MO). Alto de Choroní, *Soderstrom 974* (US, VEN). Parque Nacional Henri Pittier, *Soderstrom 1357* (US). Carretera Maracay-Choroní, *Trujillo 9146* (MY). Vic. of Colonia Tovar, *Woronow 7295* (US). BOLÍVAR: Mission Santa Teresito de Kavanayen, *Maguire & Wurdack 33758* (F, NY, US, VEN). DISTRITO FEDERAL: Between Caracas and La Guiara, *Burkhart 17001* (VEN). Cotiza, *Chase 12408* (US). Between El Junquito and Tovar, *Davidse & Morillo 3999* (MO); *Davidse 4032* (MO). Los Venador, *Lasser 996* (VEN). Near Agua Negra, *Pittier 13739* (VEN). El Junquito, *Schnee 498* (NY). Above Caracas, *Steyermark 55106* (F, US). Cerro Naiguatá, *Steyermark 92125* (US, VEN). MÉRIDA: 35 km W of Mérida, *Breteler 3124* (VEN). 66 km NE of Mérida, *Davidse 3240* (ISC, MO). Tabay, *Gehringer 398* (F, NY, US, VEN). La Mucuy, *Oberwinkler 13261* (M). Above La Azulita, *Steyermark 56098* (F, US, VEN). MIRANDA: Between Las Canales and El Encanto, *Lasser 665* (VEN). El Avila, *Morillo & Manare 1586* (VEN). SUCRE: Las Altas, *Tamayo 2125* (US). TRUJILLO: 16 km from Boconó, *Breteler 4088* (US). 34 km from Valera, *Breteler 4136* (US). ZULIA: Periva, *Gines 2034* (VEN).

SMALL-SPIKELET FORM OF *L. NIGRA*

COLOMBIA. CHOCÓ: Alrededores de San José del Palmar, *Forero & Jaramillo 2468* (MO). Carretera Ansermanuevo-San José del Palmar, *Forero et al. 2231* (MO), *2922* (MO). MAGDALENA: Sierra de Santa Marta, *Kirkbride 2223* (MO).

COSTA RICA. CARTAGO: 3–5 km from Moravia, *Croat 36611* (MO). 7 km W of Turrialba, *Croat 36842* (MO). 5 km SW of Tapantí, *Taylor & Taylor 4471* (MO). Above Platanillo, *Wilbur & Stone 10620* (MO). PUNTARENAS: Río Coto Brus, *Croat 26615* (MO). Monteverde, *Pohl & Pinette 13250* (MO). Ca. 6 km SE of San Vito de Java, *Pohl & Pinette 13275* (MO).

GUATEMALA. ALTA VERAPAZ: 2–3 mi S of Purulha, *Croat 41728* (MO).

HONDURAS. OCOTEPEQUE: 20 km from Nueva Ocotepeque, *Molina 22361* (F, MO).

MEXICO. CHIAPAS: Ca. 8 mi NE of Solistohuacan, *Davidse & Davidse 9458* (MO).

NICARAGUA. JINOTEGA: Ca. 5–8 mi SW of Jinotega, *Croat 43048* (MO).

PANAMA. CHIRIQUÍ: N of San Felix, *Mori & Kallunki 5916* (MO). COCLÉ: Ca. 3 km N of El Valle, *Mori & Kallunki 2944* (MO). DARIÉN: Cerro Sapo, *Hammel 1209* (MO). VERAGUAS: 7 km NW on rd. to Santa Fé, *D'Arcy 10258* (MO). Río Segundo Brazo, *Maas & Dressler 1635* (MO). Cerro Tute, *Witherspoon et al. 8866* (ISC, MO).

VENEZUELA. ARAGUA: Rancho Grande, *Davidse 3038* (ISC, MO, VEN).

8a. **Lasiacis oaxacensis** (Steud.) Hitchc. var. **oaxacensis**, Proc. Biol. Soc. Wash. 24: 45. 1911.

Panicum oaxacense Steud., Syn. Pl. Glum. 1: 73. 1854. TYPE: Mexico, Oaxaca, *Lenormand s.n.* (P, holotype, photograph US, fragment US).

Perennial; culms rather coarse, extensively creeping and rooting at the nodes, the ultimate parts more or less erect, 0.5–2.0 m tall, highly branched; internodes 2–5 mm thick, solid, rarely partially hollow, glabrous, mostly herbaceous; nodes glabrous; sheaths glabrous, rarely somewhat puberulent on young leaves, one or both margins usually ciliate, if both margins ciliate, then the inner one ciliate only near the apex, occasionally both glabrous; collar often densely puberulent or pubescent along the margins, with hairs 0.5–2.0 mm long, sometimes puberulent or pubescent on the back, or completely glabrous; ligule prominent, (2.0–)2.6–5.0(–6.0) mm long, brown, usually appressed puberulent or hispid on the back, the margins ciliate with hairs to 2 mm long, or glabrous, the apex ciliate and usually lacerate; blades (13–)17–29 cm long, 1.2–2.4 cm wide, narrowly linear-lanceolate, glabrous and usually conspicuously scabrous especially along the midribs, rarely puberulent when young, the margins scabrid, the base nearly symmetrical, the apex acuminate; panicles mostly terminal, 16–31 cm long, the longest branch (4–)9–18(–24) cm long, the branches widely spreading, mostly naked on the lower ½ or ⅔, bearing pedicellate spikelets in pairs or small clusters toward the ends of the branchlets; spikelets mostly 3.8–4.2 mm long; first glume 1.6–2.3 mm long, 4–6-nerved; second glume 7–11-nerved; sterile floret usually bearing a staminate flower and then possessing well-developed lodicules, the sterile palea as long as the fertile floret, the anthers 1.0–2.3 mm long, occasionally reduced to rudiments; fertile floret 3.2–3.6 mm long, 1.9–2.3 mm wide, the anthers 1.7–2.3 mm long, the stigmas purple; caryopsis 2.0 mm long, 1.6 mm wide; chromosome number $n = 18$.

Ecology: *Lasiacis oaxacensis* var. *oaxacensis* characteristically occurs along forest edges, in open places in forests and thickets, along fence rows in plantations, and shrubby road embankments. Label data from *Popenoe 15* reported that in low elevations in Guatemala, it may become prominent in cultivated fields six months after abandonment. Similar observations are reported by Johnston (1949) for San José Island, in the Pearl Islands south of Panama. There this species became very common along roadsides and trails through the forest and thickets as a result of the disturbance caused in the vegetation by U.S. forces during World War II. Subsequently abandoned areas became choked with large tangles of this species.

Variety *oaxacensis* has been collected primarily at elevations ranging from sea level to 1,600 m. The majority of flowering specimens have been collected from November to April. A number of flowering specimens from Ecuador and Peru were collected in May to October.

Distribution: *Lasiacis oaxacensis* var. *oaxacensis* is distributed in Mexico from Nayarit, south to Guerrero, eastward to Veracruz, and then south throughout Central America. I have not seen any specimens from Michoacán. In South America, it occurs in Colombia (infrequently), Venezuela, and south to Ecuador and Peru. It has also been collected in Jamaica and Hispaniola in the West Indies.

Lasiacis oaxacensis var. *oaxacensis* is characterized by its solid, procumbent culms which bear long, relatively narrow leaves that have prominent ligules and glabrous sheaths. It forms open panicles with spreading branches which bear spikelets, often in pairs or small clusters, toward the tips of the branches. The sterile palea is as long or nearly as long as the fertile lemma, and the sterile floret usually has a staminate flower. There are three collections known to me from Ecuador that do not have the solid pith, characteristic of specimens from all other areas.

Lasiacis oaxacensis is a distinctive species most closely related to *L. linearis*. The main differences between these two are discussed under the latter species. Occasional herbarium specimens representing very young plants or old, highly branched plants approach *L. standleyi* in gross appearance. However, the solid culms and more distally borne spikelets with well-developed sterile paleas reliably distinguish *L. oaxacensis*.

In occasional specimens, some of the lateral veins of the first glume may be partially or completely suppressed giving this bract a 4- or 5-nerved appearance. Such suppression may happen in any spikelet bract in any species but is perhaps somewhat more frequent in this species.

Sousa 525 from Oaxaca, Mexico, and *Davidse & Pohl 2205* from Atlantida, Honduras, are unusual in that the inflorescences contain a number of spikelets with extra fertile or sterile florets. Although the occurrence of an extra sterile lemma characterizes *L. anomala*, the presence of an extra fertile or sterile floret is known only in hybrids (unpublished). This means that the possibility of hybridization must be considered for these two collections. The Sousa specimen (MEXU) is quite fragmentary, being composed of only one inflorescence and one leaf. On the basis of the leaf, the specimen falls well within the range of *L. oaxacensis*. The inflorescence is more highly branched than is usual for *L. oaxacensis*. The evidence is not conclusive, and the unusual nature is simply noted. In the Honduranian collection, 16% of a random sample of 100 spikelets from two different inflorescences had an extra fertile or sterile floret. Some of the larger leaf blades were up to 2.7 cm in width, wider than in any specimen of *L. oaxacensis*, and the basal segments were ciliate. Blades on secondary branches were smaller. Inflorescences were also more densely branched than usual. The culms were hollow but were lined with a definite layer of pith. All these features suggest a hybrid plant. Pollen stainability was determined to be approximately 40% on the basis of samples from herbarium specimens. The anthers I used came from spikelets that had opened and begun to exsert stigmas and stamens, although none of the anthers showed dehiscence. Since anther indehiscence is characteristic of many known hybrids (unpublished), this is another indication that the plant may be of hybrid origin. *Lasiacis oaxacensis* would be one parent. The second one is unknown, but the ciliate leaf base of the putative hybrid suggests *L. procerrima* or *L. ruscifolia*, two common *Lasiacis* species with this character.

Common names: The following common names have been reported; Mexico: Oaxaca: zacate de escobe, *Sousa* 525. British Honduras: rat rice, *Gentle* 3937.

Ecuador: Chimborazo: tundilla, *Solís 5176*. Los Ríos: paja de saino, *Solís 19481*.

BELIZE. BELIZE: Gracie Rock, *Lundell 1769* (MEXU, MO, NY), *6942* (US). STANN CREEK: Near Hope Creek, *Gentle 7874* (IJ, NY, UC, US). Stann Creek Valley, *Gentle 9088* (F, US). TOLEDO: Monkey River, *Gentle 3937* (F, GH, MO, NY, US). Beyond Columbia, *Gentle 6172* (GH, IJ). Crique Negro, *Gentle 7205* (IJ, NY, UC, US).

COLOMBIA. MAGADALENA: Santa Marta, *Smith 2142* (COL, F, GH, ISC, MO, NY, P, US, WIS).

COSTA RICA. ALAJUELA: Carrillos de Alajuela, *Brenes 17380* (F, NY), *17439* (F, NY). 4 km W of Alajuela, *Pohl 12545* (ISC). GUANACASTE: Orillas del Río Bebedero, *Jiménez 724* (US). Río Naranjo, *Pohl & Lucas 13059* (MO). El Arenal, *Standley & Valerio 45151* (US). LIMÓN: Guápiles, *McKee 11101* (P). PUNTARENAS: 12 km SE ot Paso Real Ferry, *Pohl & Lucas 13121* (MO). SAN JOSÉ: San José, *Hitchcock 8488* (US), *8496* (US). Vic. of El General, *Skutch 3821* (GH, MO, NY, US), *3863* (GH, NY, US).

DOMINICAN REPUBLIC. SAMANÁ: Vic. of Sánchez, *Abbott 180* (US).

ECUADOR. CAÑAR: Río Yaguachi, *Valer 178* (MO). CHIMBORAZO: Bucay, *Solís 5176* (F, US). ESMERALDAS: Between Santo Domingo de los Colorados and Quinindé, *Asplund 16365* (US). GUAYAS: Los Alamos, *Anderson 524* (UC). Recreo, *Eggers 15572* (P, US). Milagro, *Hitchcock 20299* (F, GH, NY). LOS RÍOS: Pichilingue, *Solís 10703* (F, US), *19481* (US). PROVINCE UNKNOWN: Vic. of Ventura, *Rose & Rose 23525* (GH, NY).

EL SALVADOR. LA LIBERTAD: Santo Tomás, *Calderón 1922* (MO). Volcán San Salvador, *Davidse & Pohl 2026* (ISC); *Fassett 28590* (F, GH, US, WIS). 5 km S of Santa Tecla, *Williams & Molina 15089* (US). MORAZÁN: Montes de Cacaquatique, *Tucker 694* (F, ISC, US).

GUATEMALA. ALTA VERAPAZ: Cubilqüitz, *von Tuerckheim 7701* (US). GUATEMALA: Guatemala City, *Hitchcock 9045* (US), *9080* (US), *9107* (US). Villalobos River, *Molina et al. 16075* (F, NY). N of Guatemala City, *Popenoe 735* (US). Barranca de las Vacas, *Standley 59537* (F). Near Amatitlán, *Standley 61399* (F, US). IZABAL: Between Los Amates and Izabal, *Kellerman 7486* (NY). Murciélago, *Popenoe 15* (F). Vic. of Quirigua, *Standley 24122* (GH, NY, US). Between Milla 49.5 and Cristina, *Steyermark 38669* (F). Quirigua, *Weatherwax 17* (US), *81* (US). JUTIAPA: Between Jutiapa and La Calera, *Standley 76153* (F). QUEZALTENANGO: Near El Muro, *Standley 67236* (F). RETALHULEU: Retalhuleu, *Kellerman 6273* (F, US). E of Chivolandia, *Standley 67051* (F). SACATÉQUEZ: Near Las Lajas, *Standley 58104* (F, US). Volcán del Fuego, *Standley 60256* (F). SANTA ROSA: Near Oratorio, *Standley 60645* (F). Near Cuilapa, *Standley 77695* (F). SE of Barberena, *Standley 77791* (F).

HAITI. L'ARTIBONITE: Kalacroix, *Leonard 7997* (US). NORD: Bayeux, *Ekman 2841* (IJ, US). Vic. of Marmelade, *Leonard 8192* (F, MO, US). Vic. of Dondon, *Leonard 8572* (IJ, NY, US). Plaisance, *Leonard 9391* (GH, UC, US). SUD: Massif de la Hatte, *Ekman 7153* (GH, IJ, US).

HONDURAS. ATLANTIDA: Between Tela and Pajuiles, *Molina & Molina 25714* (F, NY). Vic. of Tela, *Standley 54543* (F, GH, US). Vic. of San Alejo, *Standley 7648* (F). MORAZÁN: 12 km E of El Zamorano, *Davidse & Pohl 2127* (ISC). Vic. of Tegucigalpa, *Standley 24910* (F, NY, UC). SANTA BÁRBARA: 1 km de Santa Bárbara, *Molina 3676* (F, GH, US).

JAMAICA. CLARENDON: Peckhaus, *Harris 12828* (F, GH, MO, NY, US). PORTLAND: Nanny Town site, *Morley & Whitefoord 490* (MO). ST. ANN: Mt. Diablo, *Hunnewell 15225* (IJ). ST. CATHERINE: *Rothrock 302* (F). ST. THOMAS: Port Morant, *Rothrock s.n.* (F, NY). TRELAWNY: Near Troy, *Hitchcock 9800* (US). WESTMORLAND: Lindo's Hill, *Harris 11832* (F, GH, MO, NY, P, US).

MEXICO. CHIAPAS: 17 km N of Tuxtla Gutiérrez, *Breedlove 13903* (F). 10 km SE of Mapastepec, *Breedlove & Thorne 30726* (MO). W side of Laguna Miramar, *Breedlove 33325* (MO). Zacualpa, *Juzepczuk 1275* (US). Jilquero, *Matuda 17286* (F, MEXU, NY). Aguas Calientes, *Miranda 1788* (MEXU). San Quentin, *Sohns 1685* (MEXU). GUERRERO: Sierra Madre, *Langlassé 556* (GH). JALISCO: 2 mi N of La Cuesta, *McVaugh 21157* (NY, UC). NAYARIT: 9 mi N of Compostela, *McVaugh & Koelz 510* (NY, US). OAXACA: Chiltepec, *Martínez-Calderón 483* (GH, UC, US). 1 km N of Tolosito, *Pohl & Davidse 11818* (ISC). Temascal, *Sousa 525* (MEXU), *1067* (MEXU). VERACRUZ: Valle de Córdoba, *Bourgeau 1461* (GH, P). Pital, *Liebman N-285* (MO). Hidalgotitlan, *Dorantes 3750* (MO). Zacuapan, *Purpus 2157* (F, MO, NY, UC). S del Volcán San Martin, *Sousa 2218* (MEXU). Fortuño, *Williams 8271* (F, P, US), *8654* (F).

NICARAGUA. CARAZO: Jinotepe, *Hitchcock 8672* (UC, US), *8698* (US). MANAGUA: Sierra de Managua, *Garnier 27* (US), *39* (US), *1557* (GH). ZELAYA: Río Grande, *Molina 2503* (F).

PANAMA. BOCAS DEL TORO: Almirante, *Cooper 105* (US). Vic. of Chiriquí Lagoon, *von Wedel 2086* (GH, MO, US). CANAL ZONE: Albrook Forest, *Blum 2089* (MO, SCZ). Barro Colorado Island, *Croat 7081* (MO), *7473* (MO), *7730* (MO), *13115* (MO). Gatún Lake, *Hitchcock A.G.N.H.412* (F, GH, NY, P, UC, US). Vic. of Frijoles, *Killip 4284* (US). Darién, *Killip 4306* (US). Empire to Mandinga, *Killip 5278* (US). Agua Clara Reservoir, *Maxon 4653* (GH, US). 7.5 km SW of the Gatún Dam, *Nee & Gentry 8671* (MO). Near Culebra, *Standley 26009* (MO, US). Vic. of Frijoles, *Standley 27410* (US). Gamboa, *Standley 28535* (US). Vic. of Gatún Lake Dam, *Tyson & Blum 1998* (MO). Curundu, *Tyson & Blum 2531* (MO). CHIRIQUÍ: Burica Peninsula, *Croat 22553A* (MO); *Liesner 64* (MO). COLÓN: 4 km ENE of Buena Vista, *Nee 9124* (MO). Between France Field and Cativa1, *Standley 30230* (US). DARIÉN: Río Chico, *Duke & Bristan 437* (MO). Río Chucanaque, *Duke 5107A* (MO). HERRERA: Río Guacino, *McCorkle C-126* (SCZ). PANAMÁ: San José Island, *Erlanson 308* (GH, NY, US); *Johnston 681* (GH), *904* (GH, US), *1032* (GH). 3 km S of Alcalde Diaz, *Nee 8853* (MO). Juan Diaz, *Standley 30591* (US). San José Island, *Tyson & Loftin 5061* (MO), *5070* (MO, SCZ).

PERU. HUÁNUCO: Tingo Maria, *Asplund 12197* (US). JUNÍN: Río Perenne, *Killip & Smith 25170* (NY, US). LORETO: Below Tabacoas, *Anderson 1018* (UC, US). SAN MARTIN: Quebrada de Huaquisha, *Schunke 7001* (MO). 3–4 km de San Juan de Pacaizapa, *Schunke 9758* (MO).

VENEZUELA. ARAGUA: Rancho Grande, *Box 3957* (MY, VEN); *Davidse 3113* (ISC, MO), *4980* (ISC, MO). Guamitos, *Pittier 15209* (US, VEN); *Tamayo 705* (VEN). MÉRIDA: Tycoporo Forest Reserve, *Breteler 3443* (COL, NY, VEN). MIRANDA: Parque Nacional Guatopo, *Croat 21700* (MO). SUCRE: Cumanacoa, *Pittier 14675* (VEN). YARACUY: Colonia El Gayobo, *Aristeguieta & Foldats 1253* (VEN).

8b. **Lasiacis oaxacensis** (Steud.) Hitchc. var. **maxoni** (Swallen) Davidse, Ann. Missouri Bot. Gard. 64: 375. 1978.

Lasiacis maxoni Swallen, Ann. Missouri Bot. Gard. 30: 231. 1943. TYPE: Panama, Chiriquí, vicinity of El Boquete, in thickets along wet trail, 1000–1300 m, 2–8 Mar. 1911, *Maxon 4999* (US, holotype; US, isotype).

Similar in aspect to *L. oaxacensis* var. *oaxacensis*; culms glabrous, solid; sheaths glabrous; collar glabrous, puberulent, or puberulent only on the margins; ligule 0.5–1.5 mm, the apex minutely ciliolate, or ciliate with hairs 1.0 mm long, tan, ciliate on the margin; blades 16–25 cm long; longest panicle branch 11–22 cm long; spikelets clearly paired near the tips of the branchlets, 3.7–4.0 mm long; first glume 1.6–2.3 mm long; sterile palea equal or nearly so to the fertile floret; sterile floret with a staminate flower; chromosome number $n = 18$.

Ecology: This variety is ecologically similar to var. *oaxacensis* in growing along forest edges, thickets, and in cleared areas as a pioneer species at elevations ranging from 800 to 1,300 m. Flowering specimens have been collected primarily from October to January, although a Honduran collection has been made in June.

Distribution: *Lasiacis oaxacensis* var. *maxoni* is known from Panama to Nicaragua.

Swallen (1943) described *L. maxoni* without differential diagnosis or discussion. In the key to Panamanian species, he used the following characters to distinguish this species from related ones: "Ligule 0.5–1.0 mm long, pale, truncate; panicles loosely flowered, the spikelets in pairs at the ends of branches

and branchlets." In panicle characteristics var. *maxoni* is identical with may specimens of var. *oaxacensis*, including the holotype. The range of variation is, however, much greater in var. *oaxacensis*. Of the two key characters, var. *maxoni* is only differentiated from *L. oaxacensis* by the short ligules. Even in this character, however, a greater range of variation has been discovered since Swallen's treatment. A number of specimens with ligule size ranging between 1 and 2 mm are now known, thus partially bridging the morphological distinction between these two taxa. Since there is no correlation with other characters, I prefer to reduce *L. maxoni* to infraspecific status.

COSTA RICA. ALAJUELA: Alajuela, *Jiménez 152* (US). 1.5 km S of San Pedro de Poás, *Pohl & Davidse 11522* (ISC). CARTAGO: Tucurrique, *Tonduz 12858* (NY). GUANACASTE: Vic. of Tilarán, *Standley & Valerio 44523* (US). SAN JOSÉ: San Pedro, *Greenman & Greenman 5289* (MO, US). Llano Grande de Puriscal, *Jiménez 887* (US). Vic. of El General, *Skutch 2226* (GH, MO, NY, US). San Francisco de Guadelupe, *Tonduz 7199* (US), *9818* (ISC).

HONDURAS. EL PARAÍSO: Agua Fria, *Molina 11338* (UC). YORO: 15 km SSE of Río Viejo, *Davidse & Pohl 2199* (ISC).

NICARAGUA. MATAGALPA: Santa Maria de Ostuma, *Williams et al. 24776* (F).

PANAMA. CHIRIQUÍ: Vic. of Boquete, *Hitchcock 8281* (US). Between Flato del Jobo and Cerro Vaca, *Pittier 5422* (US). COCLÉ: El Valle de Antón, *Dwyer 11842* (MO); *Dwyer & Nee 11942A* (MO); *Lewis et al. 2594* (COL, MO, UC).

9. **Lasiacis procerrima** (Hack.) Hitchc., Proc. Biol. Soc. Wash. 24: 145. 1911.

Panicum procerrimum Hack., Oesterr. Bot. Z. 51: 431. 1901. TYPE: Costa Rica, inter frutices ad flavium Tilirí prope La Verbena et Alajuelita, 1000 m, Aug. 1894, *Pittier 8819* (W, holotype, photograph US; US, isotype).

Short-lived perennial or annual; conspicuous unbranched, adventitious prop roots at the lower, usually decumbent nodes; culms in clumps, rarely simple, decumbent at base, (0.5–)1.0–4.0(–5.0) m long, simple or sparingly branched from the upper and middle nodes, hollow, 4–10(–12) mm thick, glabrous or occasionally puberulent below the nodes, herbaceous to lignified; nodes glabrous; sheaths glabrous or puberulent and glaucous, occasionally hispid, rarely short woolly, the overlapping sheath margin ciliate near the apex with hairs 1.5–2.5 mm long or sometimes entirely glabrous; sheath auricles, if present, up to 2.0 mm long, often pubescent and ciliate; collar glabrous to puberulent; ligule 0.5–1.5(–2.1) mm long, usually glabrous and minutely ciliolate, occasionally puberulent on the back; leaf blades linear-lanceolate or lanceolate (14–)18–35 (–42) cm long, (1.4–)1.8–4.8(–5.7) cm wide, usually broadest just above the base, usually glabrous, hispidulous, or minutely velutinous and conspicuously glaucous on the lower surface, rarely hispid with hairs to 3.0 mm long, the apex acuminate, the base conspicuously cordate, clasping the stem, the basal segments conspicuously ciliated with hairs 1.5–2.5 mm long, or glabrous, the margin scabrid; panicles large, highly branched and diffuse, (20–)32–120 cm long, about as wide, the peduncle exserted, glabrous, the branches tending to be whorled toward the base, scabrous, bearing a few widely spaced sessile or short-pedicelled spikelets on the distal ¼ or ⅙, the pulvini glabrous, rarely puberulent; spikelets (3.0–)3.5–4.0(–4.8) mm long; first glume (1.4–)1.6–2.1(–3.0) mm long, 7–11-nerved; second glume 9–11-nerved; sterile floret usually with a well-developed

staminate flower, or rarely with a perfect flower, the stamens 1.8 mm long, rarely rudimentary, the lemma 9–11-nerved, the palea ¾–⅚ the length of the fertile floret; fertile floret 3.1–3.4 mm long, 1.8–2.1 mm wide, black to grayish brown at maturity, the upper margin of the fertile lemma not inrolled, the anthers 1.6–1.9 mm long, yellowish, the stigmas white; caryopsis 2.3 mm long, 1.8 mm wide, dark brown; chromosome number $n = 18$.

Ecology: Very common on bare road embankments, also on partially wooded, brushy slopes in secondary associations, grassy slopes and thickets in open pine-oak forests, open savanna woodlands, wooded quebradas, and trails in montane forests. It has been collected up to 1,800 m. Spikelets are produced primarily from June to January.

Distribution: *Lasiacis procerrima* occurs in Mexico from Sinaloa and Durango to Puebla, south throughout Central America, across northern South America to Guyana, northern Brazil and south to central Peru.

Although Hackel (1901) cited the type collection as *Pittier 8819*, the two isotypes at US actually ascribe the collection to Tonduz, and the citation for the type collection based on these specimens is as follows: Costa Rica, Buissons au bord du Tilirí près La Verbena et Alajuelita, 1000 m, Aug. 1894, *Tonduz 8819*.

Lasiacis procerrima is the most distinctive species in the genus and is rarely misidentified. The very large leaves with prominent, clasping, basal lobes and the large diffuse panicles readily distinguishes it from all other American paniciod species. The lower branches of the inflorescence tend to become whorled, and in this it somewhat resembles *Panicum mertensii* Roth. The whorled condition is, however, much more regular and highly developed in *P. mertensii*. In *P. mertensii* panicle branches completely encircle the main inflorescence axis at the nodes, something which rarely happens in *L. procerrima*. *Panicum mertensii* can also be distinguished in that it lacks the cordate leaf bases, the large prop roots, and woolly pubescence of the spikelets. Soderstrom (pers. comm.) has suggested that this species may actually belong with *Lasiacis*. Hackel (1901), in the original description of *Panicum procerrimum*, also noted that his newly described species was closely related to *P. mertensii* (reported as *P. megiston* Schult.). This species resembles *Lasiacis* somewhat in that the somewhat globose spikelets tend to be borne obliquely on the pedicel. It differs in all the other spikelet characters by which *Lasiacis* is defined, namely the lack of woolly pubescence at the tips of the spikelet bracts, black spikelets at maturity, and the lack of gibbous-concave configuration of the fertile palea. Cytologically, Gould & Soderstrom (1970) reported *P. mertensii* to have the probable chromosome number $2n = 36$ based on a collection from Colombia. Later Pohl & Davidse (1971) reported the number to be $2n = 40$ from a Costa Rican locality. Since Gould felt his determination to be doubtful, it seems probable that the $2n = 40$ number is correct. Therefore, *P. mertensii* has the base number $x = 10$ whereas all species of *Lasiacis* chromosomally known have the base number $x = 9$. Thus, both on the basis of spikelet morphology and cytology, *P. mertensii* does not belong in the genus *Lasiacis*. Hitchcock & Chase (1910) considered *P. mertensii* (*P. megiston*) to be anomolous in the genus *Panicum*. I concur

with this point of view and feel that the unity of *Lasiacis* would be destroyed by the inclusion of *P. mertensii*.

Lasiacis procerrima commonly has glabrous, glaucous leaves; plants with pubescent leaves are less common. However, throughout Mexico and Central America, the alternatives: glabrous blades and puberulent sheaths or pubescent blades and glabrous sheaths can be found. This indicates that a number of gene loci are involved in pubescence characters and that segregation for these genes is taking place. Thus, considerable variation in pubescence is exhibited. The most extreme cases are the almost woolly sheaths of *Rodríguez 1865* (El Paraíso) and *Davidse & Pohl 2161* (Morazán) in south-central Honduras. Also notable are the hispid leaves of *Tyson 2103* (Canal Zone) and *Duke 8672* (Panamá) from central Panama. Another notable pattern of morphological variation is the widespread occurrence of plants with glabrous, glaucous leaves in South America.

Lasiacis procerrima normally has a few, well-separated sessile or short-pedicelled spikelets below the terminal spikelet. *Molina 228* from Morazán, Honduras, is unusual in having most of the spikelets conspicuously clustered in twos and threes at the ends of the inflorescence branches, a feature that often characterizes the inflorescence of *L. oaxacensis* and *L. rhizophora*. Another collection, *Davidse & Pohl 2081*, from Honduras shows an even more extreme condition of clustered spikelets. In some of the branches, the pedicels are so reduced that two or three spikelets have become united in one massive spikelet. This, coupled with the loss of some bracts of the spikelets, gives these spikelets a fascicled, abnormal appearance.

Unusually large spikelets (4.7 mm) occur in *Hinton 2408* from Temacaltepec, Mexico, and unusually large first glumes occur in *Mexia 628* (2.9 mm) from Nayarit, Mexico, and *Hitchcock 7085* (3.5 mm) from Colima, Mexico. These specimens are in all other respects typical representatives of this species.

Common names: The following vernacular names have been reported for *L. procerrima*: Mexico: Chiapas, zacatón, *Chavelas et al. 1649*. Oaxaca, cordoncilla, *Chavelas & Perez 6*. Puebla, zacatón, *Sarukhan et al. 1335*. Tabasco, zacate cenizo, *Dioscoreas 11507*. British Honduras: rat rice, *Gentle 3692*; water bamboo *Sinart 39*. Guatemala: Huehuetenango, cañuela, *Steyermark 49201*. Izabal, cola de venado, *Blake 7836*. El Salvador: San Salvador, carrizo de cohetes, *Calderón 849*. Costa Rica: Alajuela, cañuela, *Jiménez 532*; trompilla, *Jiménez 886*. Venezuela: Anzoátegui, pito-pito, *Steyermark 61115*. Colombia: Boyaca, cañuela, *Lawrance 795*.

Economic uses: *Steyermark 49201* reported on the label that in Huehuetenango, Guatemala, the cooked leaves of *L. procerrima* are reputed to be efficacious in treating bad eyes. *Lawrance 795* from Colombia and *Steyermark 61115* from Venezuela indicated *L. procerrima* to be a good forage plant for domestic animals. This seems likely considering the large, thick leaves. I think it is doubtful, however, that the species ever occurs in large enough populations to be used extensively for this purpose. The collection of Sinart (S. 39) reported on the label that the Carib Indians of British Honduras use this species for broom making.

BELIZE. CAYO: San Augustin, *Bartlett & Hunt 268* (US). Mi 28, Hummingbird Hwy., *Dwyer 11416* (MO). S of Belmopan, *Dwyer & Liesner 12075* (MO). San Augustin, *Lundell 6571* (F, NY, US). STANN CREEK: Toward Stann Creek, *Dwyer 11194* (MO). Stann Creek Valley, *Gentle 2638* (F, GH, NY). Carib Reserve, *Sinart 39* (US). TOLEDO: Monkey River, *Gentle 3692* (F, GH, MO, NY, US).

BRAZIL. AMAZONAS: Rio Negro, São Gabriel, *Baldwin 3538* (US). Mouth of Rio Uaupes, *Baldwin 3552* (US). Rio Negro, *Black 48-2496* (US); *Froés 21119* (NY, US); *Luetzeburg 22114* (NY). Tapuruquara, *Prance et al. 15832* (NY). RORAIMA: Serra dos Surucucus, *Prance et al. 10052* (MO).

COLOMBIA. ANTIOQUIA: 26 km S of Zaragoza, *Denslow 2373* (MO). Malena, *Gutiérrez & Barkley 17C145* (US); *Killip 34505* (US); *Pennell 3777* (NY, US). Entre Bocas y Anori, *Soejarto et al. 4346* (MO). Vic. of Medellín, *Toro 1100* (NY). BOYACA: N of Bogotá, *Lawrance 795* (GH, MO, RB, UC, US). CAUCA: El Tambo, *Idrobo & Fernández 108* (COL, US). CAQUETÁ: 53 km SE of Guadalupe, *Davidse et al. 5628A* (MO). 28 km S of Morelia, *Davidse et al. 5656* (MO). 23 km N of Florencia, *Davidse et al. 5764* (MO). 10 km N of Florencia, *Plowman & Kennedy 2246* (US). CHOCÓ: Bahía Solano, *Warner & White 34* (MO). CUNDINAMARCA: 20 km NW of Villavicencio, *Davidse & Llanos 5523* (MO). Iconozo, *Pennell 2870* (NY). HUILA: E of Neiva, *Rusby & Pennell 516* (NY). MAGDALENA: Rincón Hondo, *Allen 367* (MO). San Andres de la Sierra, *Pittier 1645* (US). Vic. of Santa Marta, *Seifriz 165* (US); *Smith 117* (F, MO, NY, US, WIS). META: Sierra de La Macarena, *Chaparro et al. 107* (MO); *García-Barriga & Jaramillo 17093A* (COL). Guamal, *Jaramillo et al. 1019* (COL). Near Villavicencio, *Killip 34505* (COL); *Niceforo s.n.* (COL). La Macarena, *Philipson et al. 1651* (COL). San Juan de Arama, *Pinto & Sastre 1105* (COL). Villavicencio, *Zuluaga 187* (COL). NORTE DE SANTANDER: Entre El Caraño y El Indio, *Cuatrecasas 13024* (COL, US). PUTUMAYO: Mocoa, *García-Barriga 4635* (COL). VALLE: Dagra Valley, *Killip 5366* (NY, US). Santa Rosa, *Killip 11564* (NY, US).

COSTA RICA. ALAJUELA: San Ramón, *Brenner 6514* (F). Nuestro Amo, *Jiménez 532* (US). CARTAGO: Near Muñeco, *Lent 1887* (F). IICA, *León 888* (US). Turrialba, *Pohl & Calderón 10356* (ISC). 18 km N of Turrialba, *Pohl & Davidse 10824* (F). GUANACASTE: Vic. of Liberia, *Daubenmire 399* (F); *Pohl & Davidse 10639* (ISC). 6 km S of La Cruz, *Pohl & Davidse 11317* (ISC). Vic. of Liberia, *Pohl & Davidse 11328* (ISC). HEREDIA: 35 km NE of Alajuela, *Taylor 4520* (MO). LIMÓN: 6 km W of Guápiles, *Pohl & Davidse 10016* (ISC). 1 km SW of Pueblo Nuevo, *Pohl & Davidse 11096* (ISC). PUNTARENAS: Puntarenas, *Hitchcock 8572* (US). Vic. of Boruca, *Pohl & Davidse 10993* (ISC). N of San Vito de Java, *Pohl & Davidse 11163* (ISC). SAN JOSÉ: San José, *Hitchcock 8445* (US). Vic. of San Isidro del General, *Molina et al. 18221* (F, NY, US); *Pittier 12057* (ISC, P, US). E of San Ignacio, *Pohl & Davidse 10526* (ISC). Río Conejo, *Pohl & Davidse 11055* (ISC). 8 km SW of Guarumal, *Pohl & Pinnette 13293* (MO). Vic. of El General, *Skutch 2167* (GH, MO, NY, US).

ECUADOR: Rd. from Napo to Puyo, *Ellenberg 3282* (MO).

EL SALVADOR. CHALATENANGO: 7 km SSE of La Palma, *Davidse & Pohl 2072* (ISC, MO). San Francisco del Túnel, *Weberling 2515* (M). MORAZÁN: Montes de Cacaguatique, *Tucker 777* (F, ISC, UC, US). SAN MIGUEL: Volcán de San Miguel, *Stevens & Stergios 149* (MO). SAN SALVADOR: San Salvador, *Calderón 849* (NY, US). Nördlich Cruzadillo, *Rohweder 1396* (MO). Vic. Ayutuxtepeque, *Standley 20512* (US). SANTA ANA: Metapán, *Cruz Guevara 51* (MO).

GUATEMALA. ALTA VERAPAZ: Cobán, *Bernoulli & Cario 968* (GOET). Near Secoyctí, *Cook & Griggs 119* (US). 4 mi to Oxec, *Croat 41575* (MO). Cubilqüitz, *von Tuerckheim 1028* (F, MO, US). Cobán, *von Tuerckheim 2486* (US). 12 km W of San Cristóbal, *Standley 89731* (F). Near Santa Cruz, *Standley 92783* (F). CHIQUIMULA: 6 km S of Quezaltepeque, *Harmon & Dwyer 3723* (MO). CHIMALTENANGO: Variedades, *Johnston 979* (F). Between Chimaltenango and San Martin Jilotepeque, *Standley 64296* (F). ESCUINTLA: Texcuaco, *Morales s.n.* (F). Near Escuintla, *Standley 63925* (F). GUATEMALA: Vic. of Guatemala, *Harmon 1822* (MO); *Hitchcock 9067* (US). 10 km S of San Raimundo, *Standley 62914* (F, US). Guatemala, *Tonduz 1850* (US). HUEHUETENANGO: 7 km SE of San Antonio Huiste, *Melhuis & Goodman 3630* (F, ISC). Around Ixcan, *Steyermark 49201* (F). IZABAL: Lago Izabal, *Blake 7836* (US). Ca. 7 mi S of Puerto Barrios, *Croat 41780* (MO). Vic. of Quiriguá, *Standley 24244* (US). Vic. of Puerto Barrios, *Standley 25045* (US). N of Quiriguá, *Weatherwax 85* (US). JALAPA: E of Jalapa, *Standley 77029* (F). Between Jalapa and San Pedro Pinula, *Standley 77036* (F). QUETZALTENANGO: Quetzaltenango, *Palmer 6247* (US). Colomba, *Skutch 1298* (F, GH, US). SAN MARCOS: Near San Rafael, *Croat 40779* (MO).

SANTA ROSA: Santa Rosa, *Heyde & Lux 3906* (US). Near Cuilapa, *Standley 77686* (F). Vic. of Platanares, *Standley 79136* (F). SOLOLÁ: Volcán Atitlán, *Steyermark 47989* (F). SUCHITEPÉQUEZ: Volcán Zunil, *Steyermark 35269* (F). ZACAPA: Sierra de las Minas, *Steyermark 29588* (F), *42250* (F).

GUYANA. Vic. of Kaieteur Falls, *Cowan & Soderstrom 1889* (NY, US). Potaro River, *Jenman 813* (US). Kaieteur Savanna, *Sandwith 1322* (NY, US); *Tutin 630* (US).

HONDURAS. ATLANTIDA: Vic. of La Ceiba, *Yuncker et al. 8594* (GH, MO, NY). COMAYAUGA: Near El Achote, *Yuncker et al. 5898* (GH, MO, US). COPÁN: 8 km de Santa Rosa de Copán, *Molina 12872* (US). EL PARAÍSO: 32 km W of Danlí, *Davidse & Pohl 2146* (ISC). Between La Vistada de San José and Fátima, *Molina 11173* (F). Güinope, *Rodríguez 1865* (F). MORAZÁN: Vic. of El Zamorano, *Davidse & Pohl 2081* (ISC, MO). Between San Juancito and Valle de Angeles, *Davidse & Pohl 2125* (ISC). 4 km N of Venta, *Davidse & Pohl 2160* (ISC). Vic. of El Zamorano, *Davidse & Pohl 2161* (ISC, MO); *Freytag 242* (WIS); *Glassman 1759* (F). Río de la Orilla, *Molina 228* (F, MO, US). Quebrada Terragra, *Molina 4074* (F). 28 km from Tegucigalpa, *Pilz & Pilz 1325* (MO). Vic. of El Zamorano, *Pohl 12504* (ISC), *12531* (ISC). San Antonio de Oriente, *Rodríguez 653* (F). Vic. of El Zamorano, *Standley 300* (F). Near Río Yeguare, *Standley & Williams 1623* (F). Vic. of El Zamorano, *Standley et al. 5087* (F), *22899* (F), *23323* (F), *24854* (F). San Antonio de Oriente, *Swallen 10911* (US), *10970* (US). Mt. Uyuca, *Swallen 11303* (US). Santa Inés, *Williams & Molina 10408* (US). Quebrada Triquilapa, *Williams & Molina 11983* (F, GH). Agua Amarilla, *Williams & Molina 12157* (F). OCOTEPEQUE: 10 km from Nueva Ocotepeque, *Molina 22206* (F). La Montañita, *Molina 22561* (F). SANTA BÁRBARA: 1 km from Santa Bárbara, *Molina 3665* (F).

MEXICO. CHIAPAS: 17 km N of Tuxtla Gutiérrez, *Breedlove 13905* (F). Near Rizo de Oro, *Breedlove & Thorne 20535* (DS, MO). N of Ocosingo, *Breedlove & Smith 22112* (DS, MO). Near Cerro Blanco, *Breedlove 24080* (DS, MO). 13 km N of Berriozábal, *Breedlove 26297* (DS, MO). 6–12 km N of Palenque, *Breedlove 26497* (DS, MO). 6–8 km N of Ocosingo, *Breedlove 27903* (DS, MO). 12 km S of Tuxtla Gutiérrez, *Breedlove 28036* (DS, MO). Lagunas de Monte Bello National Park, *Breedlove 37041* (DS). 21 km S of Tonalá, *Breedlove 38121* (DS). Vic. of Pinchucalo, *Chavelas et al. 337* (MEXU), *1647* (MEXU), *2255* (MEXU). 5 mi N of Ixtacomitán, *Davidse & Davidse 9435* (MO). Cuamúchil, *Enriquez 6777* (MEXU). Vic. of Ocuilapa, *Nelson 3055* (GH, US). 10 km S of Jitotol, *Roe et al. 1154* (WIS). Km 33 S of Sureste, *Roe et al. 1367* (WIS). Ti-Ha', *Ton 1450* (F, NY). Tenejapa, *Ton 1653* (NY). El Bosque to Simojovel, *Ton 3077* (NY). SW of Presa de Malpaso, *Ton 3294* (F). Cerro Palenque, *Matuda 3718* (F, GH, MEXU, NY, US). Between Escuipulas and Canada Honda, *Xolocotzi X-323* (US). COLIMA: Near Minatitlán, *Beetle et al. M-3528* (MO). Alzada, *Hitchcock 7085* (US). DURANGO: 1.8 mi W of La Guayanerga, *Jackson 134* (NY). GUERRERO: Galeana, *Hinton 14690* (GH, NY, US). Between Acahuizotla and Agua de Obispo, *Moore 5149* (GH, UC, US). JALISCO: Between Manzanillo and Puerto Vallarta, *Beetle et al. M-3579* (MO). 4 mi NNE of Talpa de Allende, *McVaugh 20155* (NY). 11 mi S of Talpa de Allende, *McVaugh 20243* (NY). Río Blanco, *Palmer 535* (F, GH, MEXU, MO, NY, US). Vic. of Guadalajara, *Pringle 1732* (F, GH, MO, NY, P, UC, US), *11760* (US). Sierra de Los Corales, *Rzedowski 17443* (US). 8 mi W of Guadalajara, *Soderstrom 611* (MEXU, US). Tequila, *Xolocotzi et al. X-2749* (US). MÉXICO: Temascaltepec, *Hinton 1948* (MO, NY, US), *2408* (NY, US). Tejupilco, *Matuda 27456* (MEXU). Santa Tomás, *Matuda 29360* (US). MICHOACÁN: 22 km S of Uruapan, *King & Soderstrom 4802* (NY, UC, US). El Ocote, *Langlassé 540* (GH, US). 7 mi SW of Uruapan, *Leavenworth & Leavenworth 1255* (US). Near Uruapan, *Woronow 2706* (US). NAYARIT: Jalisco, *Ferris 5847* (GH, US). 10 mi E of Jalcocatlán, *McVaugh 13357* (MEXU, US). 2 mi W of Mazatán, *McVaugh 19101* (NY). Tepic to Santiago, *Mexia 628* (F, MO, NY, UC, US). 1 km N of El Cuatante, *Rzedowski 17844* (US). OAXACA: N of Matías Romero, *Beetle M-3096* (MO). 18 mi W of jct. Mex. 147 and 185, *Brunken & Perino 292* (MO). 151 km SW of Oaxaca, *Brunken & Perino 371* (MO). Tuxtepec to Pueblo Viejo, *Chavelas & Pérez 6* (MEXU). Chiltepec, *Martínez-Calderón 239* (GH, UC, US). 21 km S of Valle Nacional, *Mickel 1463* (NY). 12 km S of Valle Nacional, *Mickel 1485* (NY). 35 km S of Juchatengo, *Roe et al. 586* (WIS). Tuxtepec, *Sousa 1559* (MEXU). 3 km E de Sarabia, *Vasquez 1443* (MO). PUEBLA: Pahuatlan to Huachinango, *Miranda 3697* (MEXU). Villa Juárez, *Sarukhán et al. 1335* (MEXU). SINALOA: Vic. of Culiacán, *Brandegee s.n.* (GH, UC). Cerro Colorado, *Gentry 5126* (GH, MO, NY, UC, US). 16 mi NE of Concordia, *Gould 12250* (UC, US). 56 km from Temascal, *Moore et al. 5697* (GH, UC, US). San Ignacio, *Ortega 169* (MEXU). 47 mi E of Villa Union, *Reeder & Reeder 2446* (GH). Near Colomas, *Rose 1687* (US). TABASCO: Huiman-

guillo, *Barlow 30-152* (WIS), *30-152B* (MEXU); *Discoreas 11507* (MEXU). VERACRUZ: Córdoba, *Bourgeau 1889* (P). Near Orizaba, *Bourgeau 2971* (GH, P). Zapoapan de Cabañas, *Bravo 247* (MEXU). Near Sayula, *González & Garza 8039* (MEXU). Córdoba, *Hitchcock A.G.N.H.596* (F, GH, MO, NY, P, UC, US). Orizaba, *Hitchcock 6385* (RB, US). Huitamalco, *Liebman 308* (MO). 1 mi W of Fortin, *Paxson et al. 17M671* (MEXU). Vic. of San José de Mata Clara, *Pohl & Davidse 11812* (ISC). Zaruapan, *Purpus 7813* (GH, MO, NY, US). Near Teocello, *Soderstrom 469* (US).

NICARAGUA. CARAZO: Jinotepe, *Hitchcock 8694* (US). MANAGUA: Vic. of Casa Colorado, *Standley 8775* (F). ZELAYA: W of Bluefields, *Atwood 4182* (MO). Río Lecus, *Davidse & Pohl 2347* (ISC, MO). Near Waspam, *Molina 14904* (F, NY). Río Lecus, *Pohl & Erickson 12701* (ISC), *12702* (MO).

PANAMA. BOCAS DEL TORO: Water Valley, *von Wedel 759* (GH, MO, US). Vic. of Chiriquí Lagoon, *von Wedel 1186* (GH, MO, US). CANAL ZONE: Barro Colorado Island, *Aviles 111* (F, MO); *Croat 6108* (NY), *6379* (MO). Fort Sherman, *Duke 4346* (MO). Military Rd. K-9, *Ebinger 526* (MO, US). Frijoles, *Foster & Kennedy 2026* (MO). Pipeline Rd., *Gentry 1930* (MO). Miraflores Lake, *Harvey 5135* (F). Between Pedro Miguel and Corozal, *Hitchcock 7961* (US). Gatún, *Hitchcock 7984* (US). Between Frijoles and Bohío, *Hitchcock 8393* (GH, UC, US). Ancón, *Killip 4024* (US), *12066* (US). 15–20 mi NW of Gamboa, *Mori & Kallunki 1731* (MO). 0.5 km S of Summit Gardens, *Nee 7386* (MO). 9 km NW of Gamboa, *Nee 7656* (MO). 1 km N of Gamboa, *Nee 7766* (MO). Empire to Mandinga, *Piper 5280* (US). Between Corozal and Ancón, *Pittier 6774* (US). Balboa, *Rowlee & Stork 945* (NY, US); *Standley 26055* (MO, US). Vic. of Summit, *Standley 30100* (US). Near Miraflores Lake, *Tyson 1378* (MO). Fort Sherman, *Tyson & Chu 1689* (MO). 12 mi N of Gamboa, *Tyson 6656* (MO). Near Fort Lorenzo, *Witherspoon & Witherspoon 8790* (MO). CHIRIQUÍ: NE of Fortuna, *Correa et al. 2262* (MO). Near San Felix, *Croat 33410* (MO). Llanos Francia, *Dwyer & Lallathin 8724* (MO). W of Fortuna, *Folsom et al. 5359* (MO). Vic. of Boquete, *Hitchcock 8283* (US). 4.1 mi from Boquete, *Kirkbride 90* (MO, NY). 17 km NE of San Felix, *Nee 10684* (MO). COCLÉ: El Valle, *Dwyer 1820* (MO). 7 km N of El Cope, *Folsom & Collins 6431* (MO). From El Valle to La Mesa, *Spellman et al. 559* (MO). COLÓN: Maria Chiquita, *Dwyer & Kirkbride 7800* (MO). DARIÉN: Vic. of Caná, *Croat 37633* (MO); *Sullivan 634* (MO). PANAMÁ: Cerro Campana, *Bartlett & Lasser 16902* (MO). Rd. to Cerro Campana, *Croat 12037* (MO). Panamá Viejo, *Duke 5722A* (MO). Cerro Campana, *Duke 5959* (GH, MO). Cerro Azul, *Dwyer 2635* (MO). Cerro Jefe, *Dwyer et al. 3512* (MO). San José Island, *Erlanson 383* (GH, NY, US); *Johnston 296* (GH), *442* (GH, US). Altos del Río Pacora, *Lewis et al. 2301* (COL, MO, UC). Cerro Campana, *Nee 6870* (MO). El Llano-Cartí Rd., *Nee 7878* (MO). Mouth of Río Chagres, *Piper 5948* (US). Vic. of Arenoso, *Seibert 628* (GH, MO, NY, US). Taboga Island, *Standley 27055* (US). Cerro Azul, *Tyson 2103* (MO). Cerro Campana, *Tyson et al. 2340* (MO). Sabago Island, *Tyson & Loftin 5112* (MO). Near Arraiján, *Woodson et al. 1399* (GH, MO, NY, US). Isla Taboga, *Woodson et al. 1453* (GH, MO, NY, US). SAN BLAS: SE of Puerto Obaldia, *Croat 16704* (MO).

PERU. SAN MARTIN: Tarapote, *Williams 6081* (F, GH, US). Alto Río Huallago, *Williams 6611* (F, US).

VENEZUELA. AMAZONAS: Sierra Parima, *Steyermark 105995* (MO). ANZOÁTEGUI: Cerro La Danta, *Steyermark 61115* (F, US, VEN). ARAGUA: Via Cumbre de Choroní, *Benítez de Rojas 395* (MO, MY). Rancho Grande, *Chase 12464* (US); *Davidse 3022* (ISC, MO). Alto de Caroní, *Lasser 1534* (NY, US). Maracay–Choroní, *Montaldo & Ramia 3262* (MO). Rancho Grande, *Motaldo 3581* (MY). Güigüe, *Müller 759* (VEN). Between Maracay and Ocumare, *Pittier 11854* (NY, US, VEN). Valley of Choroní, *Pittier 13918* (F, US, VEN). Rancho Grande, *Tamayo s.n.* (VEN). Maracay–Choroní, *Trujillo 5038* (MY), *10561* (MY). BARINAS: 43 km NW of Barinas, *Davidse 3193* (ISC, MO). BOLÍVAR: La Gran Sabana, *Davidse et al. 4783* (MO). Cerro Bolívar, *Maguire 32663* (NY, US, VEN). Cabeceras de Río Chicanán, *Steyermark 89542* (F, NY, US, VEN). Santa Elena, *Tamayo 2720* (US, VEN). CARABOBO: Valle de Chiragua, *Barrus s.n.* (VEN). DISTRITO FEDERAL: Caoma, *Jahn 14* (GH, US), *314* (US). El Limón, *Pittier 8059* (GH, US). MÉRIDA: Santo Domingo, *Bernardi 993* (VEN). Near Palomitas, *Box 3770* (MY). MIRANDA: Vic. of Sebastopal, *Badillo 311* (VEN). 34 km NW of Santa Lucia, *Davidse 2910* (ISC, MO). Between Los Canales and El Encante, *Lasser 675* (VEN). Between San Antonio and Los Altos, *Tamayo 1509* (VEN). Los Teques, *Williams 12424* (F). TRUJILLO: 37 km from Trujillo, *Breteler 4128* (MO, US).

10. **Lasiacis rhizophora** (Fourn.) Hitchc., Proc. Biol. Soc. Wash. 24: 145. 1911

Panicum rhizophorum Forun., Mex. Pl. 2: 31. 1886. TYPE: Mexico, region d'Orizaba, 10 Sep. 1866, *Bourgeau 3025* (P, lectotype; F, GH, MO in part, US, isolectotypes).

Perennial; culms creeping, slender, rooting at the lower nodes, freely branching and forming tangled colonies, the upper parts of the culms erect to 1 m, especially when producing inflorescences but gradually reclining with further growth; internodes 2–3 mm thick, solid, herbaceous, puberulent, especially toward the apex, sometimes restricted to the apex; nodes glabrous or puberulent; sheaths usually shorter than the internodes, usually puberulent, less often hirsute or hispid with papillose hairs to 2.0 mm long, rarely glabrous, the overlapping sheath margin usually densely ciliate at the apex, the auricular hairs at the sheath apex often prominent, 1.0–4.0 mm long; collar glabrous and usually ciliate on one margin, rarely puberulent; ligule membranous, 0.4–0.7(–1.1) mm long, prominently ciliate with hairs 1.5–3.5 mm long, glabrous on the back; blades 8–13(–17) cm long, 1.6–3.7 cm wide, elliptic-lanceolate, lanceolate, or narrowly lanceolate, the upper surface sparsely to moderately hispid or hispidulous with hairs to 1.5 mm long, scabrid, occasionally glabrous, the lower surface usually puberulent, occasionally hispidulous, hispid, or glabrous, the apex acuminate, the base strongly asymmetrical, the larger lobe slightly cordate and clasping the culm; panicles 10–19(–24) cm long, the longest branch 3–11 cm long, the branches ascending or spreading, scabrous, or puberulent, bearing spikelets markedly clustered in pairs or small groups toward the tips of the branches, the lower portions of the branches often naked, the pulvini usually puberulent, the lower ones occasionally pubescent, the pedicels scabrid or pubescent; spikelets (3.1–)3.3–3.9(–4.0) mm long; first glume 1.4–2.1 mm long, 5–7-nerved; second glume 7–9-nerved; sterile floret without a flower, or rarely with rudimentary staminate flowers, the lemma 7–9-nerved, the palea ¾ or less the length of the fertile floret; fertile floret 2.9–3.2 mm long, 1.7–2.2 mm wide, black to dark brown, the anthers 1.6–1.9 mm long, white, the stigmas purple; caryopsis 2.2–2.4 mm long, 1.7–1.9 mm wide; chromosome number $n = 18$.

Ecology: *Lasiacis rhizophora* is primarily a montane forest species having been collected at elevations from 600 to 2,000 m. It may inhabit undisturbed oak and cloud forests, but it is more commonly collected along forest margins and trails, along streams, and even in more highly disturbed areas such as coffee plantations. Spikelet-bearing plants have been collected from July through February.

Distribution: Specimens have been collected from Guerrero, Morelos, Puebla, and Veracruz in Mexico south to Colombia. Noticeably absent are collections from the Yucatán Peninsula, including Belize, and El Salvador.

Hitchcock (1913, 1920) selected the lectotype. The isolectotype at MO actually represents a mixture of two plants, one a sterile shoot of *L. rhizophora* with solid culms and roots at the nodes, the other a fertile shoot of *L. ruscifolia* that has hollow culms and a compacted inflorescence with evenly distributed

spikelets. One of the syntypes cited by Fournier (1886) in the original description is *Belanger 390* from Martinique in the West Indies. This is not *L. rhizophora* but rather *L. sorghoidea*. *Lasiacis rhizophora* is strictly continental and is not known from any of the West Indian islands. The Belanger specimen from the Paris Herbarium has a label stating it be a type, however, there does not appear to be any published reference citing this specimen as the type of *P. rhizophorum*.

Considerable doubt has existed considering the effective date of publication for Fournier's grass species included in *Mexicanas Plantas*. Reeder & Reeder (1974) have reviewed this problem, and I have followed their recommendation in using 1886 as the effective date of publication.

Lasiacis rhizophora is a well-marked species characterized by its procumbent growth habit, solid culms rooting at the nodes, broad blades, and inflorescences whose branches are naked below and bear spikelets in pairs or small clusters toward the tips of the branches. This species is confused most easily with *L. ruscifolia*, especially if the lower root producing nodes are missing. The two species can, however, be very readily distinguished since *L. ruscifolia* has hollow culms; furthermore, *L. ruscifolia* has inflorescences with evenly distributed, larger spikelets.

Pittier et al. (1945) credited *L. rhizophora* to Venezuela. This was an error since the specimens upon which the report is based (*Pittier 14162*, US, VEN) is a depauperate specimen of *L. anomala* in which the culms have bent down and secondarily rooted at the nodes. As noted under *L. grisebachii* var. *lindelieana*, Hitchcock (1936) wrongly credited *L. rhizophora* to Cuba. The report of *L. rhizophora* for the Dominican Republic was based on *Ekman 13200*, a sterile specimen. Although this specimen does have the solid culms and ciliate ligules characteristic of *L. rhizophora*, it is quite different in its roots and branching pattern. It does not seem to be *L. rhizophora*, and even its inclusion in *Lasiacis* is uncertain.

Common names: Colombia: Magdalena, arrocito, *Cuatrecasas & Cuatrecasas 25383*.

COLOMBIA. MAGDALENA: Sierra de Perijá, *Cuatrecasas & Romero-Castañeda 25383* (COL, US). VALLE: La Cumbra, *Killip 11607* (NY, US).

COSTA RICA. ALAJUELA: Near Grecia, *Anderson 1375* (US). La Palma de San Ramón, *Brenes 5371* (F, US). San Miguel de San Ramón, *Brenes 20300* (F, NY). Maravilla, *Jiménez 168* (US), *703* (US). Zarcero, *Smith H41* (MO), *A595* (MO), *48-200* (US). CARTAGO: Near San Ramón, *Brenes 4560* (F, US). Navarro, *Solís 5807* (F). 4 km SW of Tejar, *Taylor 4577* (MO). GUANACASTE: Vic. of Tilarán, *Standley & Valerio 44236* (US), *45498* (US). PUNTARENAS: Monteverde, *Jiménez 1271* (F, NY). Cañas Gordas, *Pittier 11015* (US). SAN JOSÉ: Vic. of San José, *Hitchcock 8502* (US); *Jiménez s.n.* (US). 1 mi N of San Gabriel, *Pohl & Davidse 11179* (ISC). S of San Antonio, *Pohl & Davidse 11481* (ISC). S of Curridabat, *Pohl & Davidse 11694* (ISC). Vic. of Santa Maria de Dota, *Standley 42531* (US); *Standley & Valerio 43264* (US), *44071* (US).

GUATEMALA. ALTA VERAPAZ: 10 km of Cobán, *Harmon & Dwyer 4280* (MO). Cobán, *von Tuerckheim 715* (F, GH, MO, P, US). CHIQUIMULA: 3 mi N of Jocatán, *Steyermark 31581* (F). GUATEMALA: 7 mi E of Guatemala, *Harmon 2932* (MO). Guatemala, *Hitchcock 9051* (UC, US). Between San Lucas and Guatemala, *Molina 21091* (GH, NY). Vic. of San Andrecillo, *Molina & Molina 27554* (MO). Guatemala, *Morales 1105* (F). Barranca de las Vacas, *Standley 59532* (F). HUEHUETENANGO: Crossing of Río San Juan Ixtán, *Standley 82944* (F). Between Ixcán and Finca San Rafael, *Steyermark 49468* (F). JALAPA: Cerro Alcoba, *Steyermark 32539* (F). QUETZALTENANGO: Between Finca Pirineos and Patzulín, *Standley 86730* (F, US), *86758* (F), *87059* (F). RETALHULEU: Retalhuleu, *de Koninck 238*

(US). SACATEPÉQUEZ: Ca. 20 km W of Guatemala City, *Davidson 3288* (MO). Cuesta de las Cañas, *Molina 15446* (US). SAN MARCOS: Near Aldea Fraternidad, *Williams et al. 26039* (F, GH, ISC, NY, US, WIS). SANTA ROSA: Chupadero, *Heyde & Lux 3915* (GH, US). SUCHITEPÉQUEZ: Volcán Zunil, *Steyermark 35340* (F).

HONDURAS. EL PARAÍSO: El Volcán de Monsserat, *Molina 26149* (MO). 6 km SE of San Lucas, *Pohl & Davidse 12159* (ISC, MO). 8 km W of Yuscarán, *Pohl & Erickson 12748* (ISC, MO). Güinope, *Valerio 1762* (F). MORAZÁN: Cerro Uyuca, *Davidse & Pohl 2107* (ISC); *Molina 1433* (F, US). Río Yeguare, *Molina 2766* (F, GH, MO, US). Río Rancho Quemado, *Molina 18651* (F, GH, NY). Between La Vuelta del Zope and San Juan del Rancho, *Molina & Molina 25824* (MO). Cerro Uyuca, *Standley 14073* (F), *23109A* (F, US); *Swallen 10903* (US); *Williams 16851* (F, GH). 20 km N of Siguatepeque, *Williams & Williams 18422* (US).

MEXICO. CHIAPAS: 18–20 km N of Ocozocoautla, *Breedlove & Thorne 21025* (DS, MO). 42 km NE of La Trinitaria, *Breedlove & Thorne 21101* (DS, MO). 16 km NW of Rizo de Oro, *Breedlove & Smith 21703* (DS, MO). 6–8 km N of Ocosingo, *Breedlove & Smith 22173* (DS, MO). SE of Cerro Baul, *Breedlove 27602* (DS, MO). 6–8 km N of Ocosingo, *Breedlove 27923* (DS, MO). 30 km NW of Ocozocoautla, *Breedlove 28904* (DS, MO). 20 km S of Ocozocoautla, *Breedlove 29085* (DS, MO). 3 km E of Francisco Madero, *Breedlove 38025* (DS, MO). Between Escuipulas and Canada Honda, *Hernández-X. X-309* (US). Monte Cristo Salina, *Matuda 1939* (F, GH, MEXU, NY, UC, US). Sierra Madre, *Tateoka 1030* (US). GUERRERO: Galeana, *Hinton 10809* (GH, NY, US), *14633* (GH, NY, US). MORELOS: Sierra de Ocuila, *Lyonnet 2888* (US). OAXACA: *Reko 3486A* (US). VERACRUZ: Vic. of Orizaba, *Botteri 633* (GH); *Bourgeau 3025* (F, GH, P). Córdoba, *Hitchcock A.G.N.H.413* (F, GH, MO, NY, P, UC, US). Vic. of Orizaba, *Muller 2029* (NY); *Seaton 60* (F, GH, US).

NICARAGUA. GRANADA: Mt. Mombacho, *Grant 821* (GH, US). JINOTEGA: 3.8 mi SE of Yalí, *Croat 42914* (MO). 5–8 mi SW of Jinotega, *Croat 43046* (MO). Near Santa Maria de Ostuma, *Hawkes et al. 2192* (F).

PANAMA. CHIRIQUÍ: Volcán Chiriquí, *Davidse & D'Arcy 10158* (MO).

11a. **Lasiacis rugelii** (Griseb.) Hitchc. var. **rugelii**, Bot. Gaz. (Crawfordsville) 51: 302. 1911.

Panicum rugelii Griseb., Cat. Pl. Cub. 233. 1866. TYPE: Cuba, in montibus Mantanzas, scandens in fruticibus, 1849, *Rugel 188* (GOET, lectotype; GH, isolectotype).

Lasiacis papillosa Swallen, Publ. Carnegie Inst. Wash. 436. 349. 1934. TYPE: Mexico, Yucatán, Peto, erect in bush, 26–27 July 1932, *Swallen 2707* (US, holotype; MO, isotype).

L. lancifolia Swallen, Publ. Carnegie Inst. Wash. 436: 349. 1934. TYPE: Mexico, Yucatán, Muna, along trail in hills, culms erect, 22–23 July 1932, *Swallen 2664* (US-1537246, holotype; GH, US, 4 sheets, isotypes).

Perennial; culms erect or clambering and climbing, 0.6–3 mm long, in clumps, the upper parts of young culms often strongly zigzag, the older culms highly branched, often with fascicles of secondary branches on the primary culm; internodes hollow, 2–5 mm thick, lignified, usually papillose-puberulent with hairs often appressed, becoming glabrous in age but roughened due to remaining papillae, rarely glabrous except for a line of puberulence, completely glabrous, or densely short pubescent with hairs to 0.7 mm long; nodes usually glabrous, occasionally sparsely to densely puberulent; sheaths spreading puberulent, often densely puberulent or velutinous, the upper margin ciliate with hairs 0.5–2.0 mm long, occasionally the lower margin ciliate on the upper half, the auricular hairs 1–2 mm long; collar usually puberulent, sometimes with an additional line of dense pubescence at its base with hairs to 1.0 mm long; ligule very inconspicuous, 0.1–0.3 mm long, glabrous, or ciliolate with hairs to 0.5 mm long; blades lanceolate to ovate-lanceolate, (2.5–)3.5–5.5(–9.5) cm long, (0.5–)0.8–1.5 (–2.2) cm wide, the upper surface sparsely to densely puberulent, rarely glabrous, the lower surface puberulent or velutinous, rarely glabrous, the apex acute

to acuminate, the base asymmetrical, the margin scabrid; panicles small, 2–10(–14) cm long, the longest branch 1–5.5 cm long, the branches bearing few, evenly distributed spikelets, the lower branches and most branchlets reflexed or at least widely spreading, the branches puberulent, often densely so toward the base, the upper part of the panicle occasionally only scabrid, the pulvini puberulent; spikelets obovate, (3.8–)4.0–4.8 mm long; first glume 1.5–2.1 mm long; 7–9-nerved; second glume 9–11-nerved; sterile floret without a flower, the sterile palea ¾ to equal the length of the fertile floret, the lemma 9–11-nerved; fertile floret 3.8–4.1 mm long, 2.3–2.6 mm wide, light tan at maturity; caryopsis 2.4–2.6 mm long, 1.9–2.1 mm wide, whitish.

Ecology: *Lasiacis rugelii* var. *rugelii* is an inhabitant of wooded areas and is most commonly collected in thickets, along trails, forest margins, and in secondary forests, as well as in pine forests in Cuba. The only elevation records give 100 and 700 m. Plants bearing spikelets have been collected in all months except May, but the main flowering period extends from July to March.

Distribution: *Lasiacis rugelii* is found in Cuba, Hispaniola (infrequently), San Luis Potosí, Veracruz, and the Yucatán Peninsula, including Belize and parts of Guatemala and Mexico.

Grisebach (1866) cited two syntypes (*Rugel 188* and *Wright 3465*) with his description of *Panicum rugelii*. Hitchcock (1909) chose *Rugel 188* as the lectotype.

This species is characterized by its erect, usually puberulent culms, small broad blades, and sparsely flowered inflorescences with reflexed or widely spreading branches bearing obovate spikelets. It is closely related to *L. divaricata* var. *divaricata*. It can be distinguished from this taxon by its shorter and wider blades and usually puberulent culms and leaves.

Hitchcock (1936) described *L. rugelii* as prostrate. He may have based this description largely on a specimen (*Hitchcock 176*) he collected in Cuba. The label with the specimens notes, "creeping, not climbing as *P. divaricatum*." However, *L. rugelii* is primarily an erect species with culms climbing into shrubby vegetation. All Cuban specimens which show culm bases are clearly erect plants. An Ekman specimen (*Ekman 795*) bears a label stating that "this species has a tolerably strong central cane up to 2 m high." Even in the original description, Grisebach (1866) described this species as scandent, basing this description on Rugel's observation. It is possible that Hitchcock collected a specimen which had secondarily become procumbent. This happens occasionally when young, thin stems which are not supported become lodged and root at the nodes. Having recognized the essentially erect growth habit of *L. rugelii*, it then becomes necessary to reduce *L. papillosa* Swallen to synonymy since the distinction between these two species was based almost entirely on this character. This is evident from the differential diagnosis Swallen (1934) provided following the original description of *L. papillosa*: "Similar to *Lasiacis rugelii* (Griseb.) Hitchc., but that species is strictly prostrate." The West Indian and Central American populations are very similar in other characters besides culm morphology, although the Central American plants tend to be somewhat more robust.

Only two collections of *L. rugelii* from Hispaniola were seen; these have culm internodes that are glabrous except for a line of pubescence extending down from the sheath margin.

When describing *L. lancifolia*, Swallen (1934) stated in the differential diagnosis that this species was related to *L. ruscifolia*. I disagree with Swallen. The type specimen is identical to numerous Yucatán collections of *L. rugelii* in the shape and pubescence of the leaves and the size and type of inflorescence and spikelets. The type does differ from all Central American specimens of this species in its completely glabrous culm. I believe this lack of culm pubescence does not indicate specific rank. It seems to be a further step in the reduction of culm pubescence already noted in the Hispaniolan representatives of this species. The type collection, which is excellently documented with four sheets showing different segments of mature and immature culms, is remarkable in that it represents the most vigorous plant of *L. rugelii* that I have seen. The internodes of the main culm are 9 mm thick and also bear the largest blades recorded for this species.

BELIZE. BELIZE: Western Hwy. km 35, *Croat 24770* (MO). Mi 50 New River Toll Bridge, *Dwyer 12757* (MO). Maskall, *Gentle 1218* (GH, MO, NY, US). Belize-Cayo Rd., *Gentle 9605* (US). CAYO: Macal River, *Dwyer & Liesner 12284* (MO). 39 mi sect. of Hummingbird Hwy., *Gentle 8974* (F, IJ, NY, UC, US). Belize-Cayo Rd., *Gentle 9605* (US), *9691* (IJ, UC, US); *Rose Innes 49* (IJ, ISC). San Augustin, *Lundell 6840* (F, GH, MO, NY, US). 8 mi SW of El Cayo, *Proctor 29550* (IJ). Millionario, *Proctor 29865* (IJ). COROZAL: Corozal, *Gentle 560* (US). ORANGE WALK: S of Orange Walk, *Croat 24990* (MO). Honey Camp, *Lundell 91* (F, US), *550* (MO, US); *Meyer 56* (F). STANN CREEK: Commerce Bight Pine Ridge, *Gentle 8064* (F, GH, US). Stann Creek to Siltee Rd., *Lundell 6840* (US), *7943* (US). TOLEDO: Monkey River, *Gentle 4249* (MO).

CUBA. HABANA: Marianao, *Ekman A.G.N.H.795* (F, GH, MO, NY, P). Lomas de Camoa, *Ekman 13516* (US). San Antonio, *Hitchcock 176* (ISC, US). La Vigia Tapaste, *León 10668* (GH). San Miguel de Casanova, *León 12458* (US), *12459* (US), *12460* (US). ISLA DE PINOS: Coe's Camp, *Britton & Wilson 14860* (F, GH, NY). Cayo del Res, *Ekman 12446* (NY, US). MANTANZAS: Vic. of Mantanzas, *Britton et al. 106* (NY); *Ekman 16489* (US). Boca de Canasí, *León 13698* (US). ORIENTE: Guatánamo, *Ekman 10306* (F, US). Sierra de Nigre, *Ekman 15242* (US). Peninsula de Cabo Cruz, *Ekman 16151* (F, NY, US). Cobra Range, *León et al. 10608* (GH). PINAR DEL RÍO: Near Taco-Taco, *Barber 3790* (F, NY). Rosario Mts., *León 15103* (GH). Sierra de Anafe, *Wilson 11449* (F, NY, US).

DOMINICAN REPUBLIC. PUERTO PLATA: Sosúa, *Ekman 14531* (US).

GUATEMALA. ALTA VERAPAZ: 15 mi W of Telemán, *Croat 41538* (MO). Below Tamahú, *Standley 91779* (F, US). IZABAL: Above Eximbal, *Harmon & Dwyer 4334* (MO). 1 km W of Río Blanco, *Harmon & Fuentes 4883* (MO). PETÉN: Tikal Park, *Contreras 268* (F, IJ, US), *274* (US). Dos Lagunas, *Contreras 1519* (IJ, US), *1737* (IJ, US), *1738* (US). Santo Toribio, *Contreras 2692* (US). Tikal Park, *Contreras 3723* (US), *3724* (US), *3884* (US). 2 mi S of Tikal Nat. Park, *Croat 24709* (MO). Tikal Park, *Lundell 15531* (US), *15713* (US), *16106* (IJ, US), *17145* (US). 20 km E of Santa Ana, *Molina 15680* (US).

HAITI. NORD OUEST: Ile de Tortue, *Ekman 4254* (GH, IJ, US).

HONDURAS. COPÁN: 1 mi W of Copán Ruins, *Molina 30846* (MO).

MEXICO. CAMPECHE: Tuxpeña, *Lundell 918* (F, GH, NY, US), *1354* (F, GH, MO, NY, US). CHIAPAS: 32 km NW of Ocozocoautla, *Breedlove 27517* (MO). QUINTANA ROO: Lake Chichancanab, *Gaumer 23685* (F, GH, US); *Swallen 2761* (MEXU, MO, US). Tancah, *Swallen 2824* (US). Gozumel Island, *Swallen 2902* (US). SAN LUIS POTOSÍ: S of Vallejo, *Clark 6852* (MO). San Dieguito, *Palmer 151* (GH, NY, US). Río de las Gallinas, *Purpus 5438* (F, GH, MO, NY, UC, US). TABASCO: 4 km del Naranjito, *Menendez et al. 260* (MO). Balancán, *Novelo et al. 30* (MO). YUCATÁN: Chichen Itzá, *Beetle M-3793* (MO). Chichen Itzá, *Swallen 2429* (US), *2451* (US), *2464* (US). Tizimín, *Swallen 2518* (US). Uxmal, *Swallen 2640* (GH, US). Muna, *Swallen 2665* (US). Peto, *Swallen 2677* (MO, US), *2695* (US), *2696* (US), *2697* (US), *2698* (US), *2707* (US), *2712* (MO, US), *2713* (US),

2716 (US). VERACRUZ: 3 km de El Raudal, *Gómez-Pompa 84* (MEXU). Laguna Tamiahua, *Le Sueur 704* (GH, US).

11b. **Lasiacis rugelii** (Griseb.) Hitchc. var. **pohlii** Davidse, Ann. Missouri Bot. Gard. 64: 375. 1978. TYPE: Costa Rica, Cartago, 1 km NE of Pejibaye, along Río Pejibaye, growing at base of tree, ca. 700 m, 2 Nov. 1968, *Pohl & Davidse 11478* (ISC, holotype; CR, EAP, K, MO, US, isotypes).

Perennial; culms caespitose, 1–5 m long, erect at the base, rather weak, arching and climbing into vegetation, occasionally secondarily procumbent and rooting at the nodes; internodes hollow, 3–6 mm thick, usually glabrous or with a line of puberulence on one side, rarely puberulent throughout; nodes glabrous; sheaths densely puberulent, the overlapping margin ciliate with hairs 1.0 mm long, the auricular hairs 1.5 mm long; collar with a dense line of hairs at its base, the hairs to 1.0 mm long, the collar extended as a distinct pseudopetiole, 1–3 mm long; ligule an inconspicuous whitish membrane 0.1–0.4 mm long, glabrous; blades ovate-lanceolate to lanceolate, 4–7 cm long, 0.8–1.5 mm wide, the upper surface glabrous or more commonly minutely puberulent along the lower half of the midrib, the lower surface glabrous or minutely puberulent, the base asymmetrical, abruptly narrowed to nearly truncate, the margin scabrid, the apex acuminate; panicles usually not fully exserted, 3–7 cm long, the longest branch 2.0–3.5 cm long, the branches ascending to spreading, short pubescent or only scabrid, the pulvini usually puberulent, especially below; spikelets globose, 3.6–4.2 mm long; first glume 1.7–2.1(–2.5) mm long, 7–9-nerved; second glume 9-nerved; sterile floret without a flower, the lemma 9-nerved, the palea ½ to subequal the length of the fertile floret; fertile floret 3.8–4.0 mm long, 2.4–2.6 mm wide, brown; caryopsis 2.2–2.4 mm long, 2.0–2.1 mm wide.

Ecology: This variety has been collected only along margins of cloud forests or rain forests at elevations from 0 to 800 m. Collections have been made from July through January.

Distribution: Known only in Central America from Guatemala, Nicaragua, Costa Rica, and Panama.

Lasiacis rugelii var. *pohlii* is named after my major professor, a leading American agrostologist, Dr. Richard W. Pohl, Iowa State University.

It is similar in aspect to var. *rugelii* but differs in having glabrous culms (only rarely puberulent) that are not conspicuously zigzag, glabrous upper blade surfaces, a more pronounced pseudopetiole with abruptly narrowed blade base, smaller inflorescences with smaller, globose spikelets, and branches not reflexed or widely spreading.

This variety is morphologically very distinct and easily recognizable. It completely replaces var. *rugelii* in southeastern Central America. Specimens have previously been named *L. divaricata* or *L. sorghoidea* (sensu Hitchcock) apparently depending whether emphasis was placed on the puberulent sheaths or glabrous blades.

Small-leaved specimens of *L. ruscifolia* approach var. *pohlii* in appearance but can be easily recognized by their more ovate blades with broader, culm-

clasping, ciliate bases. The spikelets are quite similar to those of *L. ruscifolia* because they are globose as in the species. The fertile floret also has a rather well-developed shelf at the base of the fertile palea and lemma as in *L. ruscifolia*. It is possible that var. *pohlii* forms a link between *L. ruscifolia* and *L. rugelii*.

COSTA RICA. ALAJUELA: 3 km W of La Palma, *Pohl & Davidse 11264* (ISC). CARTAGO: Near Turrialba, *Lent 616* (F); *Pohl & Davidse 10829* (ISC). Vic. of Pejivalle, *Skutch 4655* (F, GH, MO, US). Tuis, *Tonduz 11397* (M, US). PUNTARENAS: Boruca, *León 1063* (US). SAN JOSÉ: Vic. of El General, *Skutch 3862* (GH, MO, NY, US), *4040* (GH, MO, NY, US).

GUATEMALA. ALTA VERAPAZ: Cubilqüitz, *von Tuerckheim 1481* (F, MO, US), *8620* (GH, M, UY, US).

NICARAGUA. ZELAYA: 3 km S of Bilwaskarma, *Davidse & Pohl 2303* (ISC). Río Alemán, near Esquipulas and Alemán, *Shank & Molina 4755* (F, US).

PANAMA. BOCAS DEL TORO: Almirante, N of Dos Milla, *McDaniel 5121* (MO). COCLÉ: Above El Valle de Antón, *Croat 25353* (MO), *37418* (MO); *D'Arcy & D'Arcy 6748* (MO); *Dwyer & Correa 7974* (COL, MO), *7978* (MO, UC). 7.2 km from El Valle, *Folsom 6932* (ISC, MO). Antón, La Mesa, *Kennedy et al. 2103* (MO); *Nee & Hale 9616* (MO). El Valle, *Soderstrom 2012* (MO). 5 mi N of El Valle, *Tyson et al. 2422* (NY). La Mesa, *Weaver & Foster 1657* (MO). PANAMÁ: Cerro Campana, *Croat 12142* (ISC, MO, NY), *14221* (MO). Cerro Azul, *Croat 17287* (MO). Cerro Jefe, *Davidse & D'Arcy 10103* (MO). 2 mi S of Goofy Lake, *Lewis et al. 244* (MO).

12a. **Lasiacis ruscifolia** (H.B.K.) Hitchc. var. **ruscifolia**, Proc. Biol. Soc. Wash. 24: 145. 1911.

Panicum ruscifolium H.B.K., Nov. Gen. Sp. Pl. 1: 101. 1816. TYPE: Mexico, Volcán de Jorullo, 490 hexap. (P, holotype; P, isotype).

P. compactum Schwartz, Adnot. Bot. 14. 1829, non *P. compactum* Kit., 1814. TYPE: Jamaica, *Swartz s.n.* (S, holotype, photograph S).

P. liebmannianum Fourn., Mex. Pl. 2: 33. 1886. TYPE: Mexico, Consoquitla, Aug. 1841, *Liebmann 299* (C, holotype, photograph US, fragment US; C, isotype).

P. liebmannianum var. *depauperatum* Fourn., Mex. Pl. 2: 33. 1886. TYPE: Mexico, inter Guatulco et S. Miguel del Puerto, Oct. 1842, *Liebmann 280* (C, lectotype).

Lasiacis compacta (Swartz) Hitchc., Proc. Biol. Soc. Wash. 24: 145. 1911.

L. liebmanniana (Fourn.) Hitchc., Proc. Biol. Soc. Wash. 24: 145. 1911.

L. globosa Hitchc., Contr. U.S. Natl. Herb. 17: 251. 1913. TYPE: Mexico, Acapulco and vicinity, Oct. 1894–March 1895, *Palmer 114* (US-691226, holotype; GH, MO, US-744073, isotypes).

L. glabra Swallen, Ceiba 4: 287. 1955. TYPE: Honduras, El Paraíso, road to Danlí, moist shady banks near Río San Francisco, 1 Nov. 1951, *Swallen 11193* (US-2076931, US-2153497, US-2153498, holotype; ISC, isotype).

Perennial; culms caespitose, 1–8 m long, erect at the base, arching, growing and leaning on vegetation; internodes lignified, usually hollow, rarely pithy, 5–12 mm thick, glabrous, puberulent, papillose-pubescent, or pubescence reduced to a single line; nodes glabrous, rarely puberulent; sheaths papillose-hispid, with hairs to 3.5 mm long, glabrous or puberulent, the overlapping margin ciliate with hairs 0.5–2.0 mm long, the auricular hairs to 3 mm long; collar puberulent or glabrous, occasionally densely pubescent; ligule usually inconspicuous, (0.3–)0.5–0.8(–1.0) mm long, glabrous or ciliate with hairs to 0.7 mm long; blades ovate, ovate-lanceolate, or occasionally narrowly lanceolate, (4–)6–14(–16) cm long, (1.0–)1.8–4.4(–5.6) cm wide, glabrous, puberulent, pubescent, hispid, or villous, the base asymmetrical, clasping the culm, the margin of the base usually ciliate with hairs 1–3 mm long, sometimes glabrous, the margin scabrid, the apex acute to acuminate; panicles rather dense, (2–)4–16(–22) cm long, the longest branch

1–6(–9) cm long, the lowest three panicle branches widely separated, widely spreading at maturity, scabrous or puberulent, the lower pulvini usually puberulent, sometimes glabrous; spikelet globose (2.6–)2.8–3.8(–4.0) mm long; first glume (1.0–)1.2–2.2 mm long, 9–13-nerved; second glume 11–13-nerved; sterile floret without a staminate flower, the lemma 11–13-nerved; the palea ⅔ to equal the length of the fertile floret; fertile floret 2.8–3.6 mm long, 2.0–2.9 mm wide, dark brown to grayish black, the anthers 1.4–2.3 mm long, white, the stigmas white, the base of the fertile lemma usually with a distinct shelf from which a sterile projection often arises, the palea usually deeply concave; caryopsis 2.0–2.5 mm long, 1.7–2.2 mm wide; chromosome number $n = 18$.

Ecology: *Lasiacis ruscifolia* var. *ruscifolia* is common in dry deciduous forests and scrub forests, coastal thickets, and gallery forests. It is also occasional along wet forest margins and shrub communities. Elevation records are almost all below 1,000 m. The main period of inflorescence production is from June to February.

Distribution: *Lasiacis ruscifolia* var. *ruscifolia* is common in Mexico from Lower Baja California and Sinaloa across Mexico below the northern deserts and south throughout Central America. One collection is known from the United States in southern Florida. In South America, it is known from Colombia, Venezuela, and Ecuador and in the West Indies from Cuba and Jamaica.

In describing *P. liebmannianum* var. *depauperatum* Fournier (1886) listed one collection under subvariety α and two under subvariety β but none under variety *depauperatum* itself. I have chosen the specimen under subvariety α as the lectotype of var. *depauperatum*. All three cited specimens belong with *L. ruscifolia* var. *ruscifolia*.

Lasiacis ruscifolia var. *ruscifolia* is a widespread and variable taxon. It is distinguished by its broad blades, short ligules, and rather dense panicles bearing distinctly globose spikelets. The blades of the main culm are usually broadly ovate and suffice to identify this variety. However, those of the minor secondary branches are often conspicuously narrower. The majority of specimens from Guayas, Ecuador, have soild pithy culms rather than the hollow culms that characterize the species in the other parts of its range.

As a whole, this variety is especially variable in pubescence, but three pubescence types predominate. These are: (1) plants rather prominently puberulent throughout the sheaths and the blades, (2) plants strongly papillose-hispid on the sheaths but glabrous on the blades, and (3) plants glabrous on both sheaths and blades.

Lasiacis ruscifolia var. *ruscifolia* is closely related to *L. sorghoidea* var. *sorghoidea*. The latter species is distinguished most readily by its longer, narrower leaves. It also differs in having a more open panicle with longer branches, bearing narrower, more obovate spikelets than in *L. ruscifolia*. The large majority of Central American and West Indian specimens of *L. sorghoidea* can be effectively distinguished by their distinctive pattern of leaf pubescence. In *L. sorghoidea* var. *sorghoidea*, the upper blade surface is puberulent, the lower surface is velutinous, the collar is densely hispid, and the sheath is conspicuously

papillose-hispid. This combination is only found very rarely in *L. ruscifolia* var. *ruscifolia*.

In South America, especially in Ecuador and Colombia, the two species are not as distinct because *L. sorghoidea* var. *sorghoidea* tends to have wider leaves and denser inflorescences. There I have relied heavily on pubescence characters and assigned all those with the typical *L. sorghoidea* var. *sorghoidea* pattern to that taxon. I have recognized as *L. ruscifolia* var. *ruscifolia*, plants with puberulent sheaths, broad ovate leaves, short inflorescence branches, and distinctly globose spikelets. Although the two taxa seem to merge somewhat in this area, I have continued to recognize them at the species level because they maintain their separate identities throughout the rest of their range of sympatry. Fieldwork in Ecuador and Colombia is needed to fully resolve the evolutionary interaction (if any) between these taxa.

Several morphological types within this polymorphic have received specific recognition.

Lasiacis liebmannianum Fourn. represents a morphological type with narrow, compact panicles in which the panicle branches are strictly appressed to the main inflorescence axis. However, I have seen collections taken from the same plant in which these panicle branches spread at maturity, and I have observed a similar narrow inflorescence as an abnormality in a single greenhouse plant of *L. ruscifolia*. Thus, this morphological type may not have a genetic basis.

Lasiacis globosa Hitchc. was distinguished on the basis of small spikelet size (ca. 3.0 mm). However, measurements of a large number of spikelets from plants throughout the range of the species showed a normal distribution of spikelet size from 2.8 to 3.8 mm, the average of all specimens being 3.3 mm. Therefore, plants with small spikelets occupy the lower end of a continuum, and there is no evident discontinuity to justify taxonomic recognition.

Lasiacis glabra Swallen was considered closely related to *L. ruscifolia* by Swallen (1955b) but was described as a new species on the basis of having elongate, simple or only sparingly branching flowering branches, and being completely glabrous, except for the somewhat ciliate sheaths. However, the lack of pubescence is again an end point of a continuum in pubescence development. Although Swallen stated that *L. glabra* was based on the single holotype collection, Hitchcock (1920) had already noted that glabrous plants of *L. ruscifolia* occur occasionally throughout Central America. They also occur in Mexico and South America. The lack of branching of the flowering culms alluded to by Swallen is definitely only a developmental stage. All vigorous greenhouse plants of *L. ruscifolia* var. *ruscifolia* produce large terminal inflorescences on unbranched culms. After or shortly before the spikelets have matured, the main culm may begin to branch extensively.

BELIZE. BELIZE: Mi 42.5 on Northern Hwy., *Dwyer 11005* (MO). Altun Hua, *Wiley 562* (MO), *564* (MO). CAYO: El Cayo, *Bartlett 11522* (GH, US). Xunanturich, *Rose Innes 192* (ISC). Macaw Bank, *Lundell 6576* (US). CORAZAL: Port Sal, *Gentle 104* (F); *Rose Innes 92* (IJ); *Lundell 4906* (GH, NY, UC, US).

COLOMBIA. ANTIOQUIA: 1 km antes Occidente, *Barkeley et al. 445* (COL, US). 2 km N of Antioquia, *Barkley et al. 17C059* (COL). Alrededores de Antioquia, *Barkeley et al. 17C374* (COL). 1 km antes Occidente, *Scolnik et al. 19An319* (UC, US). ATLANTICO: Entre Palmar

de Varela y Ponedera, *Dugand & Barriga 2440A* (COL, US). Entre Barona y Galapa, *Dugand 5782* (COL). Barranquilla, *Elias 250* (US), *1098* (F, NY, US). BOLÍVAR: Near Cartagena, *Killip & Smith 14082* (COL, GH, NY, US). Cartagena Bay, *Killip & Smith 14126* (F, GH, MO, NY, US). N of Arjona, *Killip & Smith 14513* (GH, NY, US). Vic. de Beltrán, *Romero-Castañeda 9888* (COL). CUNDINAMARCA: Vic. of Apulo, *Killip et al. 38261* (COL, US). MAGDALENA: Hoya del Río Cesar, *Cuatrecasas & Romero-Castañeda 24893* (COL, US), *24922* (COL, US). 20 km NW of La Jagua, *Haught 3633* (COL, US). Pivijay, *Romero-Castañeda 24893* (COL, US), *24922* (COL, US). Pivijay, *Romero-Castañeda 9096* (COL, MO). Santa Marta, *Smith 174* (MO, US, WIS). SAN ANDRÉS ISLAND: *Daniel 5641* (US); *Fernández-Pérez 5194* (COL, US); *Torres 220* (COL). SANTANDER: Vic. of Suratá, *Killip & Smith 16476* (GH, NY, US). Río Zulia, *Molina et al. 18NS052* (US). VALLE: Between Cartago and Alcolá, *Cuatrecasas 22909* (F, US). Palmira, *García-Barriga 18858* (COL).

COSTA RICA. ALAJUELA: Nuestro Amo, *Jiménez 531* (US). Crecia, *Jiménez 1127* (US). Las Ventanas, *León 2926* (US). Río Grande de Tárcoles, *Pohl & Davidse 11355* (ISC). GUANACASTE: Ca. 40 km N of Liberia, *Anderson & Mori 269* (F). Near 27 Abril Rd. to Playa Tamarindo, *Burger & Ramírez 4117* (F, NY, US). Vic. of Cañas, *Daubenmire 169* (F), *438* (F). 40 km N of Cañas, *Davidse 833* (UC). NE of Liberia, *Dodge et al. 6251* (GH). Vic. of Cañas, *Gentry 303* (MO, WIS). W of Bagaces, *Heithaus 307* (MO). Colonia Carmona, *Jiménez 361* (US), *369B* (US), *376* (US). Río Bebedero, *Jiménez 725* (US). Santa Rosa National Park, *Liesner 4241* (MO), *4422* (MO). Taboga, *Pohl & Calderón 9826* (ISC), *10139* (ISC). 21 km N of Liberia, *Pohl & Calderón 10161* (ISC). Ca. 40 km N of Liberia, *Pohl & Calderón 10180* (ISC). Ca. 8 km S of La Cruz, *Pohl & Calderón 10183* (ISC), *10184* (ISC), *10196* (ISC). Vic. of Cañas, *Pohl & Davidse 10541* (ISC, MO), *11335* (ISC). Murciélago, *Pohl & Davidse 11562* (ISC). Vic. of Libano, *Standley & Valerio 44888* (US). Bebedero, *Standley & Valerio 46695* (US). Ca. 8 km S of La Cruz, *Williams et al. 26436* (F, NY, US). Bahía de Sta. Elena, *Williams et al. 26703* (F, NY, US). PUNTARENAS: Southern Nicoya Peninsula, *Burger & Liesner 6583* (F, MO). Near Puntarenas, *Hitchcock 8570* (US), *8571* (US), *8577* (US). Near the Puntarenas jct., *Pohl & Davidse 11278* (ISC). SAN JOSÉ: Isla de Chira, *Valerio 1484* (F).

CUBA. CAMAGÜEY: Palo Seco, *Ekman 15318* (NY, US). ISLA DE PINOS: Columbia, *Britton et al. 14659* (NY, US). Vivijagua, *Britton et al. 15065* (NY, US). Near Nueva Gerona, *Curtis 520* (F, GH, MO, NY, P, US); *Ekman 11721* (F, NY, US). Sierra Las Casas, *Killip 44165* (US). Sierra de Caballos, *Killip 44533* (US). Near Nueva Gerona, *Palmer & Riley 904* (US). LAS VILLAS: Near Sancti Spiritus, *León 905* (US). Banao Mts., *Luna 898* (NY), *1005* (NY). ORIENTE: Ensenada de Mora, *Britton et al. 12979* (NY, US). Santiago, *Clemente 5683* (GH, US). Rioja, *Ekman 4903* (US). Sabanaso, *Ekman 635* (F, NY, US). Near Caney, *Ekman 7681* (US). Between Marimon and Boniato, *Ekman 7699* (US). Coufiaua, *Hioram & Baptiste 1351* (NY). Near Guatánamo, *Hioram 2240* (GH, NY); *León 3778* (NY, US). PINAR DEL RÍO: Vic. of Las Palacios, *Shafer 11684* (NY).

CURACAO. Christoffel Mtn., *Arnoldo 1926* (US); *Stoffers 1184* (A, IJ).

ECUADOR. GUAYAS: Vic. of Guayaquil, *Anthony & Tate 63* (US); *Asplund 5687* (US), *5807* (US). Chongón, *Asplund 5879* (US). Vic. of Guayaquil, *Hitchcock 19963* (GH, NY, US). Between Guayaquil and Salinas, *Hitchcock 20057* (GH, NY, US). Vic. of Guayaquil, *Hitchcock 20125* (US), *20135* (US); *Holway & Holway 801* (US); *Mille 34* (US), *1089* (F); *Solís 20582* (US). ORO: Between Santa Rosa and La Chorita, *Hitchcock 21130* (US).

EL SALVADOR. AHUACHAPÁN: Vic. of Ahuachapán, *Standley & Padilla 2738* (F); *Standley 19870* (GH, MO, NY, US). CHALATENANGO: Near Chalatenango, *Davidse & Pohl 2068* (ISC). LA LIBERTAD: 12 km W of La Libertad, *Davidse & Pohl 2023* (ISC, MO). 15 km W of La Libertad, *Davidse & Pohl 2024* (ISC). N shore of Lago Ilopango, *Davidse & Pohl 2033* (ISC, MO). LA UNIÓN: Vic. of La Unión, *Standley 20660* (GH, US). MORAZÁN: 15 km NE of San Miguel, *Tucker 488* (F, ISC, UC, US). SANTA ANA: E side of Lago Coatepeque, *Davidse & Pohl 2037* (ISC). 6 mi N of Metapán, *Davidse & Pohl 2066* (ISC, MO). Santa Ana, *Hitchcock 8850* (UC, US). 11 km E of Metapán, *Pohl & Erickson 12583* (ISC, MO). SAN MIGUEL: Lolotique, *Cruz Guevara 76* (MO). Vic. of San Miguel, *Standley 21138* (GH, US). SAN SALVADOR: Vic. of San Salvador, *Calderón 67* (GH, NY, US), *510* (NY, US), *861* (US); *Hitchcock 8903* (US). Vic. of Tonacatepeque, *Standley 19421* (GH, US), *19437* (GH, NY, US). Vic. of San Salvador, *Standley 22465* (GH, MO, NY, US). SAN VICENTE: Vic. of San Vincente, *Standley & Padilla 3390* (F), *3673* (F, UC).

GUATEMALA. ALTA VERAPAZ: 15 mi W of Telemán, *Croat 41532* (MO). Alta Verapaz, *Standley 70650* (F). CHIQUIMULA: 3 km S of Quezaltepeque, *Harmon & Dwyer 3697* (MO).

Above Chiquimula, *Standley 74328* (F). Between Ramírez and Cumbu de Chiquimula, *Standley 74531* (F). Chiquimula, *Steyermark 30083* (F, US). Near Jacotán, *Steyermark 31536* (F). EL PROGRESO: 8 km S of El Progreso, *Iltis G-73* (WIS). ESCUINTLA: 12 km W of Escuintla, *Harmon & Fuentes 4684* (MO). Hwy. 2A, *Harmon & Fuentes 4719* (MO). Near Escuintla, *Standley 63929* (F). Near San José, *Standley 64089* (F). Between Masagua and San José, *Standley 64127* (F). HUEHUETENANGO: Between Neutón and Catarina, *Steyermark 51810* (F, US). IZABAL: Vic. of Lake Izabal, *Jones & Facey 3474* (IJ, US); *Snedaker C-47* (F). W of Zapotillo airstrip, *Snedaker D-51* (F). JALAPA: Between Jalapa and San Pedro, *Standley 77080* (F, US). Vic. of Jalapa, *Standley 77392* (F). Between Monjas and Jalapa, *Steyermark 32186* (F). JUTIAPA: Vic. of Jutiapa, *Melhuis & Goodman 3703* (F, ISC); *Standley 74885* (F, US), *75253* (F, US), *75541* (F). Between Jutiapa and Las Tunas, *Standley 76224* (F, US). PETÉN: 2 mi E of Melchor, *Croat 24618* (MO); *Dwyer 11245* (MO). Lake Petén, *Dwyer 11274* (MO). 3 mi W of Melchor, *Gentry 8266* (MO). N of El Cruce, *Gentry 8319* (MO). Lake Petén, *Lundell 3861* (US). Yaxha–Remate, *Lundell 3862* (US). Lake Petén Itza, *Lundell 17240* (US). 35 km E of Santa Elena, *Molina 15430* (F). QUICHE: *Aguilar 1437* (F). RETALHULEU: Between Nueva Linda and Champerica, *Standley 87711* (F, US). Along the Río Coyote, *Standley 88381* (F, US). SAN MARCOS: Near Malacatán, *Standley 68861* (F). SANTA ROSA: Jumaytepeque, *Heyde & Lux 3899* (GH, US). Near Guazacapán, *Standley 78693* (F). SE of Chiquimulilla, *Standley 78784* (F). NE of Chiquimulilla, *Standley 78882* (F). Río La Cruz, *Standley 79009* (F). Vic. of Chiquimulilla, *Standley 79254* (F). SUCHITEPÉQUEZ: Cocales, *Standley 62085* (F, US). Suchitepéquez, *Standley 62192* (F). Vic. of Tiquisate, *Steyermark 47667* (F, US). ZACAPA: Between Río Hondo and Santa Cruz, *Standley 74114* (F). Vic. of Santa Rosalia, *Steyermark 29294* (F).

HONDURAS. ATLANTIDA: La Ceiba, *Alduvín 124* (MO). Lancetillo, *Chickering 9* (US). 9 km E of Tela, *Davidse & Pohl 2188* (ISC, MO). 33 km E of Tela, *Davidse & Pohl 2190* (ISC, MO). 17 km SSE of La Ceiba, *Davidse & Pohl 2198* (ISC, MO). Vic. of Tela, *Mitchell 20* (GH). Lancetilla, *Molina 10392* (F). Vic. of Alejo, *Standley 7705* (F). Vic. of Tela, *Standley 53273* (A, F, US), *54553* (A, F, US), *54779* (A, F, US). Lancetilla, *Williams & Molina 14442* (F, GH). Vic. of La Ceiba, *Yuncker et al. 8226* (F, GH, MO, NY). CHOLUTECA: Vic. of San Marcos de Colón, *Standley 15957* (F). Vic. of Pespire, *Standley 27134* (F). COPÁN: Vic. of Copán, *Molina & Molina 24610* (F, NY), *24779* (F, NY). Between Santa Rita and Titoror Creek, *Molina 30663* (MO). CORTES: 1 km S of Puerto Cortes, *Davidse & Pohl 2169* (ISC, MO). Río Ulua, *Molina 5646* (F). Near Potrerillos, Cortes, *Yuncker 4915* (F, MO). EL PARAÍSO: Ca. 45 km E of Tegucigalpa, *Freytag s.n.* (WIS). Below Guayabille, *Molina 654* (F, GH). Río Yeguare, *Molina 1085* (F, US). 9 km S of Danlí, *Pohl & Gabel 13424* (MO). MORAZÁN: Vic. of El Zamorano, *Davidse & Pohl 2082* (ISC, MO). Río Yeguare, *Glassman 1924* (F, NY). Vic. of El Zamorano, *Molina 1393* (F, US); *Rodríguez 123* (F), *125* (F). Tatumbla, *Rodríguez 525* (F). Río Yeguare, *Rodríguez 981* (F), *997* (F). Vic. of El Zamorano, *Standley 367* (F), *1500* (F, MO), *12159* (F), *15177* (F), *22316* (F, UC), *23581* (UC); *Swallen 10785* (US), *11009* (US), *11159* (US). Río Yeguare, *Williams & Molina 10343* (A, F, MO); *Williams 15956* (US), *16915* (F, GH, MO). OCOTEPEQUE: Vic. of San Antonio, *Molina 22466* (F, NY). OLANCHO: Between San Felipe Catacamas and El Plomo, *Molina 13279* (F). SANTA BÁRBARA: 4 km NE of La Arada, *Harmon & Dwyer 3825* (MO). Vic. of Santa Bárbara, *Molina 22013* (F, MO, NY).

JAMAICA. PORTLAND: Port Antonio, *Millspaugh 984* (F). ST. ELIZABETH: Font Hill, *Britton 1509* (NY). WESTMORLAND: Bluefields, *Britton 1624* (NY).

MEXICO. BAJA CALIFORNIA SUR: Sierra La Giganta, *Carter et al. 2023* (GH, MEXU, UC, US); *Carter & Kellogg 3110* (MEXU, UC, US); *Gentry 4130* (GH, MO, UC). CAMPECHE: Tuxpeña, *Lundell 927* (F, MO, NY, UC, US), *1315* (F). CHIAPAS: Between Tapachula and Puerto Madero, *Beetle M-4021* (MO). Between Escuintla and Mapastepec, *Beetle M-4036* (MO). Between La Trinitaria and El Jocote, *Beetle M-4141* (MO). 11 mi S of La Trinitaria, *Breedlove & Raven 13247* (F). 1 km N of Ocozocoautla, *Breedlove 19803* (MO). Near Rizo de Oro, *Breedlove & Thorne 20654* (MO). NW of Puerto Arista, *Breedlove & Thorne 20875* (MO). 15 km SW of Suchiapa, *Breedlove 28223* (MO). 25–30 km SE of Tonalá, *Breedlove 28329* (MO). 5–6 km NW of Las Cruces, *Breedlove 28449* (MO). 6–8 km NE of Huixtla, *Breedlove 28581* (MO), *28582* (MO). 10 km SE of Mapastepec, *Breedlove & Thorne 30735* (MO). 5 km N of Cintalapa, *Breedlove 36588* (MO). 5 km W of Rizo de Oro, *Breedlove 36707* (MO). Rd. to Nueva Concordia, *Breedlove 37617* (MO), *37636* (MO). 6–8 km E of Frontera Comalapa, *Breedlove 39046* (MO). Ca. 21 mi NE of the Tehuantepec-Tapachula intersection, *Davidse & Davidse 9571* (MO). Zacualapa, *Juzepczuk 1360* (US). Escuinta, *Matuda 2117* (GH, NY, UC, US). Tonalá, *Matuda 16898* (F, MEXU,

MO). Escuinta, *Matuda 17180* (F, MEXU, NY). Tonalá, *Matuda 17204* (F, MEXU). San Fernando, *Miranda 5127* (MEXU). 24 km E of Villa Flores, *Miranda 5952* (MEXU). Berriozábal, *Miranda 6718* (MEXU). Monserate, *Purpus 425* (F, US). 4 km SW of Las Rosas, *Roe et al. 1003* (WIS). 15 km N of Pueblo Nuevo, *Roe et al. 1264* (WIS). Between Sureste and Mal Paso, *Roe et al. 1432* (F, WIS). Mapastepec, *Tateoka 1001* (US), *1032* (US). El Chorreadero, *Ton 2947* (WIS). Acala to Pugiltik, *Ton 3180* (NY). El Chorreadero, *Ton 3269* (NY). N of Mapastepec, *Xolocotzi X-225* (US). CHIHUAHUA: Río Mayo, *Gentry 2402* (F, GH, MEXU, MO, UC, US). Hacienda San Miguel, *Palmer 10* (GH, MEXU, NY, P, US). COLIMA: Between Manzanillo and Minatitlan, *Beetle et al. M-3511* (MO). Paso del Río, *Emrick 15* (F). Manzanillo, *Hitchcock 7027* (F, GH, MO, NY, UC, US), *7028* (US), *7034* (US), *7044* (US). Alzada, *Hitchcock 7079* (F, GH, NY, UC, US), *7087* (F, GH, MO, NY, UC, US). Manzanillo, *Palmer 1089* (GH, MO, NY). DURANGO: Near Huasenate, *Rose 3502* (GH, US). Río Mezquital, *Soule 2130* (MO), *2133A* (MO). GUERRERO: Grutas de Cacahuamilpa, *González 1770* (WIS). Guayameo, *Hinton 9386* (GH, MO, NY). Montes de Oca, *Hinton 11381* (GH, MO, NY, US), *11569* (NY, US). Galena, Atayac, *Hinton 14610* (GH, NY, US). Acapulco, *MacDaniels 166* (F). Temisco, *Mexia 8717* (F, GH, MO, NY, UC, US). Puerto Marque, *Miranda 8421* (MEXU). Acahuitzotla to Acapulco, *Moore 5107* (GH, UC, US). Tlalixtaquilla, *Nelson 2254* (GH, US). Almoloya–Teloloapan–Iguala, *Sohns 966* (US). HIDALGO: Vic. of Huejutla, *Moore 2207* (GH). JALISCO: La Barranca, *Bárcena 138* (MEXU). S of Ciudad Guzmán, *Beetle et al. M-3437* (MO). Between Autlán and Bajia de Navidad, *Beetle el al. M-3564* (MO), *M-3567* (MO), *M-3575* (MO). 14 km SW of Puerto Vallante, *Carter & Chisoki 1261* (UC). Guadalajara, *Hitchcock 7368* (US). Near Río Grande de Santiago, *Leavenworth & Leavenworth 1901* (F, GH, MO, NY). 10–16 mi NE of Autlán, *McVaugh 19756* (NY), *19778* (NY). 16 mi SW of Autlán, *McVaugh 19975* (NY), *19981* (NY). 8 km NW of Barra de Navidad, *McVaugh 20761* (NY). Between Bahía Navidad and La Manzanilla, *McVaugh 21022* (NY, UC). 2 mi above La Cuesta, *McVaugh 21144* (GH, NY, UC, WIS). 2 km SE of Puerto Vallarta, *Rzedowski 17729* (US). SE de Puerto Vallarta, *Rzedowski 17758* (US). MÉXICO: Temascaltepec, *Hinton 1767* (GH, MEXU, US), *4847* (NY, US). Otzoloapan, *Matuda 31445* (MEXU, MO). Tlatlaya, *Matuda 32100* (MEXU). MICHOACÁN: Aguila, *Hinton 16121* (IJ, NY, US). 32 km N of Playa Azul, *King & Soderstrom 4925* (MEXU, NY, UC, US). 4 mi NW of Apatzingán, *McVaugh 17925* (NY, US). 75 km from El Tamascal, *Moore et al. 5665* (GH, UC, US). 8 km NW of Aguila, *Rzedowski 17932* (US). MORELOS: Cuernavaca, *Leavenworth & Leavenworth 913* (F). Xochiltepec, *Lyonnet 2172* (US). Cañon de Lobos, *Miranda 1654* (MEXU). Near Yautepec, *Pringle 11293* (F, GH, MEXU, MO, NY, US). NAYARIT: Near San Blas, *Alva & Cook 1608* (UC). 15 km W of Ahuacatlán, *Feddema 518* (US). Vic. of San Blas, *Ferris 5322* (US). Tres Marias Isl., *Ferris 5656* (MO, US). Vic. of Jalisco, *Ferris 5848* (GH, MEXU, US). 19 mi NW of Tepic, *McVaugh & Koelz 722* (US). E of Tepic, *Pennell 19961* (MEXU, US). 1 km N of El Cuatante, *Rzedowski 17880* (US). NUEVO LEÓN: 20 km NW of Montemorelos, *Weaver 1005* (GH, US). OAXACA: Between Acayucan and Tehuacán, *Beetle M-3114* (MO). 18 mi W of Jct. Mex. 147 and Mex. 185, *Brunken & Perino 286* (MO), *288* (MO). Inchitán, *Conzatti 3697* (MEXU). Tepenix Tlahuaca, *Conzatti 4370* (MEXU). Costa Chica, *Kaplan & Kaplan 170AX55* (F, GH, MEXU). Vic. of Concordia, *Morton & Makrinius 2441* (F, US). Ca. 132 km S of Oaxaca, *Norris & Taranto 16501* (MO). 9 km S of Matías Romero, *Pohl & Davidse 11821* (ISC, MO). Temascalpa to San Ildefanso de Villa Alto, *Santos 3534* (NY, US). Tuxtepec, *Sousa 743* (MEXU). PUEBLA: Matamoros, *Miranda 2375* (MEXU). Huachinango, *Salazar 5* (MEXU). Villa Juárez, *Sarukhán 1476* (MEXU). Between México and Tuxpan, *Sarukhán 2918* (MEXU). QUINTANA ROO: Tancah, *Swallen 2808* (MEXU, US), *3816* (US). SAN LUIS POTOSÍ: Vic. of Tamazunchale, *Carlson 2772* (F). El Bonito, *Chase 7544* (GH, US). Vic. of Tamazunchale, *Edwards 478* (MO, UC, US). 11 mi W of Ebano, *Johnston & Crutchfield 5679* (US). Vic. of Xilitla, *Kenoyer A599* (F). Vic. of Tamazunchale, *Kenoyer 1017* (F, MO); *Lundell & Lundell 7251* (US). 15 km S of Antiguo Morelos, *Norris 17427* (MO). Near Xolol, *Pohl & Davidse 11808* (ISC, MO). Vic. of Salto de Agua, *Sohns 1408* (US), *1417* (US). Hwy. 55 to Xilitla, *Sohns 1436* (US). SINALOA: Vic. of Mazatlan, *Barr & Mason 64-12* (UC). Vic. of Culiacan, *Brandegee s.n.* (US). Above Cofradia NE of Imala, *Breedlove 35586* (MO). Vic. of Labadras, *Ferris & Mexia 5141* (F, GH, US). Imala, *Gentry 4981* (GH, MO, NY, US). Cerro Llano Redondo, *Gentry 7097* (F, GH, NY, UC, US), *7097A* (GH, NY, UC, US). La Noria, *Mexia 187* (UC). Elota, *Ortega 5901* (GH, US). Vic. of Mazatlan, *Ortega 813* (MEXU). Cacalotan, *Ortega 1005* (MEXU). Vic. of Mazatlan, *Ortega 4330* (US), *5973* (US). Chametla, *Ortega 6459* (GH, US). Závalo, *Ortega 7487* (MO). Mazatlán, *Rose et al. 14112* (US). Acaponeta, *Rose et al. 14409* (US). Vic. of

Rosario, *Rose et al. 14521* (NY, US). SONORA: Alamos, *Drouet & Richards 3945* (F, US). Mescales, Río Mayo, *Gentry 2290* (US). Guasaremos, *Gentry 2402* (US). SE of Ciudad Obregon, *Gentry 14525* (US). Sierra de Alamos, *Rose et al. 12822* (US). 8 mi NE of Matapa, *Wiggins & Collins 430* (GH, MO, NY, UC, US). 18 mi SE of Magdalena, *Wiggins 7148* (GH, US). 10 mi N of Ures, *Wiggins 7351* (US). TABASCO: 21 km W of Cardenas, *Conrad & Conrad 2966* (MO). La Palma to Balancan, *Matuda 3292* (F, GH, MEXU, US). Teapa, *Rovirosa 573* (NY). TAMAULIPAS: Vic. of Marmolejo, *Bartlett 10796* (GH, ISC, MEXU, US). S of Mante, *Elias et al. 7* (A). Tampico, *Fischer 46193* (US). 2 mi N of Antigua, *Graham & Johnston 4411* (MEXU). 5 mi N of San Rafael, *Johnston & Crutchfield 4957* (MEXU). 35 mi S of Victoria, *Johnston 5754* (US). Tampico, *Kenoyer 1021* (F, MO). 22.5 km from Manuel, *Martínez & Luyando F159* (US). Jaumave, *Rozynski 76* (F, UC). Chamal, *Swallen 1639* (US), *1709* (US). VERACRUZ: 25 mi SE of Xalapa, *Barkley et al. 2625* (MEXU). Cabañas, *Bravo 218* (MEXU). Alemán Cosamaloapan, *Calderón 1094* (MEXU, MO). Tlalixcoyan, *Calderón 1561* (MEXU, MO). San Lorenzo Tenochtitlan, *Chavelas et al. ES-2657* (MEXU). Ciudad Alemán Cosamaloapan, *Delgadillo 1094* (MO). Barra Platanar, *Dorantes et al. 1281* (MO). E of San Andrés Tuxtla, *Dressler & Jones 5* (GH, MEXU, MO, NY, UC, US). El Jicacal, *Gómez-Pompa 4881* (MEXU). Chavarillo, *Johnson s.n.* (US). Palmar, *McDaniels 876* (F). Misantla, *Purpus 5978* (F, GH, MO, NY, P, US). Zacuapan, *Purpus 7877* (GH, MO, NY, US). 1 mi E of Santiago Tuxtla, *Reeder & Reeder 4333* (US). Goyame, *Rosas 1375* (A, MEXU). Zacuapan, *Rozynski 620* (F). Near Sontecomapan, *Rzedowski 20342* (MEXU). Veracruz-Jalapa Rd., *Soderstrom 459* (US). Plan del Río, *Ventura 4198* (WIS). San Antonio, *Woronow 2182* (US). Paso de Ovejas, *Xolocotzi X-3371* (US). YUCATÁN: Uxmal, *Beetle M-935* (ISC, US). Mayacan, *Beetle M-957* (WIS). Near Kabah, *Beetle M-3814* (MO). Chichen Itza, *Bequaert 53* (A). Calotmul, *Gaumer 2141* (F). Chichankanab, *Gaumer 2461* (F, GH, P, NY). Oxmal, *Iltis 27278* (MO, WIS). Chichen Itza, *Millspaugh 11639* (F). Valladalid to Tizimín, *Miranda 133* (MEXU). Uxmal, *Rzedowski 26343* (WIS). Mérida, *Schott 600* (F, US); *Seler 3835* (F). Chichen Itza, *Steere 166* (US), *1299* (US), *Swallen 2398* (US), *2418* (US). Tizimín, *Swallen 2514* (US). Uxmal, *Swallen 2635* (US). Peto, *Swallen 2694* (US), *2717* (MEXU, US).

NICARAGUA. BOACA: Boaca, *Seymour 3841* (F, GH, MO, NY, WIS). CARAZO: Jinotepe, *Hitchcock 8676* (US), *8715* (US), *8719* (US). CHINANDEGA: Corinto, *Hitchcock 8743* (US). Potosí, *Marshall & Neill 6608* (MO). CHONTALES: From Juigalpa NE toward La Libertad, *Stevens 4041* (ISC, MO). Ca. 2.8 km N of Cuapa, *Stevens 6061* (MO); *Vincelli 68* (MO). ESTELÍ: 4 mi S of Estelí, *Dwyer et al. 446* (MO). GRANADA: Volcán Mombacho, *Dudley & Moore 1948* (NY). LEÓN: Quesalguague, *Baker 2105* (GH, MO, US). Poneloya, *D'Arcy 10401* (MO). Along the Río Sinecapa, *Stevens 3845* (MO). MANAGUA: Vic. of Managua, *Chaves 409* (US). 27 km S of Managua, *Davidse & Pohl 2379* (ISC, MO). Vic. of Managua, *Garnier 41* (US), *408* (US), *A-1241* (GH, US), *1490* (F, US), *1550* (GH, WIS), *1551* (GH, WIS), *4558* (GH, WIS); *Maxon et al. 7546* (GH, US). Río Santa Clara, *Neill 2875* (MO). Masachapa, *Nichols 1363* (MO). Tipitapa, *Seymour 2831* (MO). Km 11 on Hwy. 12, *Stevens 4756* (MO). MASAYA: Lake Masaya, *Atwood 3289* (F, GH, MO, NY). Masaya, *Hitchcock 8710* (US). Parque Nacional Volcán Masaya, *Neill 2843* (MO); *Stevens 5275* (MO). MATAGALPA: Matagalpa, *Molina 22843* (F, NY). Hwy. to Matagalpa, *Molina 22858* (F, NY). NUEVA SEGOVIA: 3 km W of Ocotal, *Atwood 761* (GH, NY); *Seymour 845* (GH, MO, NY). RIVAS: Km 142 Route 2, *Harnblett 1874* (NY). San Juan del Sur, *Hitchcock 8607* (US).

PANAMA. CANAL ZONE: Río Abajo, *Bartlett & Lasser 16397* (MO). Beyond Fort Amador, *D'Arcy 9262* (MO). Ft. Kobbe, *D'Arcy 9619* (MO). Madden Dam, *Ebinger 858* (MO, US). Balboa, *Hitchcock 8060* (US). Between Panamá and Corozal, *Hitchcock 9204* (US). Gutuncillo, *Piper 5272* (US). Balboa, *Standley 25258* (US), *25438* (US), *26077* (MO, US), *29318* (MO), *32134* (US). Farfan Beach area, *Tyson 1806* (MO, US). Fort Amador, *Tyson 2012* (MO). Madden Lake, *Witherspoon & Witherspoon 8801* (MO). CHIRIQUÍ: Burica Peninsula, *Busey 574* (MO). COCLÉ: Penonemé, *Conte 15* (MO). 20 mi S of Nata, *Croat 9642* (MO). Río Penonomé, *Henriquez 14* (MO). La Pintada, *León 25* (MO). Aguadulce, *Lezcano 26* (MO); *Pittier 4987* (US), *4998* (F, GH, US). HERRERA: Pesé, *Allen 797* (F, GH, MO, NY, US). Río Santa Maria, *Burch et al. 1187* (MO, UC). LOS SANTOS: 5 mi S of Pocrí, *Croat 9739* (MO). Las Tablas, *Dwyer 2529* (MO, US). Vic. of Tonosí, *Stern et al. 1865* (MO, US). PANAMÁ: Taboga Island, *Allen 137* (GH, MO, US), *1290* (GH, MO, NY, US). Trapeche Island, *Allen 2624* (MO, US). Taboga Island, *Celestius 47* (US). Río Oharco–Espiritu, *Duke 5702* (MO). Isla de la Bayonetia, *Dwyer 1752* (US). San José Island, *Harlow 73* (GH, US). Pacora, *Hertentains 13* (MO). Taboga Island, *Hitchcock 8068* (US). Vic.

of Panamá, *Hitchcock 8401* (UC, US). San José Island, *Johnston 162* (GH, US), *187* (US), *1255* (US). Bella Vista, *Killip 4040* (NY). Taboga Island, *Killip 4157* (US). Bella Vista, *Killip 12011* (GH, NY, US). Chimán, *Lewis et al. 3328* (MO, UC). Taboga Island, *Macbride & Featherstone 2788* (F, GH, NY, US). San José Island, *Miller 1895* (MO). Taboga Island, *Mori & Kallunki 4075* (MO); *Pittier 3603* (US). Chepo, *Pittier 4688* (NY). Matías Hernández, *Pittier 6892* (US). Bella Vista, *Standley 25302* (US). Near Panamá, *Standley 26890* (US). Taboga Island, *Standley 27017* (US), *27870* (US). Punta Paitilla, *Standley 30807* (US), *30809* (US); *Sucre 123* (MO). Taboga Island, *Tyson & Loftin 5150* (SCZ). VERAGUAS: Camino a Santa Fé, *Cisneros 20* (MO). Puerto Mutis, *Tyson 6028* (MO, SCZ).

UNITED STATES. FLORIDA: Manatee Co., Terra Ceia Island, *Beckner 794* (WIS).

VENEZUELA. ANZOÁTEGUI: 21 km E of Piritu, *Davidse 5020* (MO). ARAGUA: Maracay, *Cárdenas 456* (MO, NY). 19 km NW of Rancho Grande, *Davidse 3120* (ISC, MO). 2.5 km S of Cata, *Davidse 3125* (ISC, MO). Vic. of Taiguaiguai, *Fernández 444* (MO, NY). Maracay, *Montaldo s.n.* (MY). Ocumare de la Costa, *Williams 12182* (F, VEN). CARABOBO: Punta Palmita, *Benítez de Rojas 365* (MO, NY). Near El Palito, *Pittier 7686* (GH, US, VEN). Valencia to El Paíto, *Trupillo s.n.* (MY). Isla del Burro, *Vareschi 1905* (VEN). COJEDES: Río Pao, Paraima, *Trujillo 5442* (NY). GUÁRICO: 16 km SSW of Calabozo, *Davidse 2944A* (MO). 14 km N of Dos Caminos, *Davidse 3012* (ISC, MO). 15 km SW of Tamaco, *Davidse 4220* (MO). San Juan de los Morros, *Fernández 1409* (MY). LARA: Río Turbido, *Fernández 922* (MY). Alrededores de Barquisimeto, *Trujillo 7533* (MY). MIRANDA: La Moka, *Eggers 13480* (US). 2 km NW of Carenero, *Steyermark & Bunting 102299* (VEN). YARACUY: Camino de Oroa, *Curran 309M* (VEN). ZULIA: Cerca Mene Grande, *Pittier 10617* (GH, NY, US, VEN).

12b. **Lasiacis ruscifolia** (H.B.K.) Hitchc. var. **velutina** (Swallen) Davidse, Ann. Missouri Bot. Gard. 64: 375. 1978.

Lasiacis velutina Swallen, Ceiba 4: 288. 1955. TYPE: Honduras, Morazán, vicinity of El Zamorano, road to San Antonio, 17 Oct. 1951, *Swallen 10834* (US, holotype).

Perennial; culms caespitose, 1–6 m tall, erect at the base, arching or leaning on vegetation; internodes 3–7 mm thick, lignified, hollow, glabrous or with a line of puberulence; nodes glabrous; sheaths pilose or velutinous, the overlapping margin and throat ciliate, the auricular hairs 2–3 mm long; collar pilose; ligule 0.2–0.6(–1.0) mm long, ciliolate, inconspicuous; blades ovate to ovate-lanceolate, 2–7(–9.5) cm long, 0.8–2.8 cm wide, the upper surface hispid to velutinous or pilose, the lower surface softly long pilose, the base asymmetrical, the basal segment clasping the culm and ciliate, the apex acute to acuminate; panicles 4–13 cm long, the longest branch 2–7 cm long, the lower portion of the panicle included in the sheath or exserted, the branches ascending or spreading somewhat, pilose or pubescent, the pulvini usually pilose; spikelets subglobose, 3.5–4.0 mm long, usually purple when immature; first glume 1.5–2.3 mm long, 9–11-nerved; second glume 11–15-nerved; sterile floret with a staminate flower, the anthers 2.4 mm long, the lemma 9–13-nerved, the palea subequal the length of the fertile floret; fertile floret 3.2–3.8 mm long, 2.1–2.5 mm wide, the anthers 2.2–2.3 mm long, white, the stigmas purple; caryopsis 2.2 mm long, 1.7 mm wide; chromosome number $n = 18$.

Ecology: This variety is found in brushy borders, moist thickets, and among trees of oak and oak-pine mountain forests from 700 to 1,300 m. Spikelet-bearing plants have been collected from June through December.

Distribution: *L. ruscifolia* var. *velutina* has been found only in central Honduras and northern Venezuela.

The distinctive pilose or velutinous pubescence, usually purple spikelets and

relatively small, broad leaves characterize this taxon. In many respects, it seems intermediate between *L. ruscifolia* var. *ruscifolia* and *L. nigra*. In its subglobose spikelets and ovate blades, it resembles *L. ruscifolia* var. *ruscifolia*. In its pubescence, more open inflorescences, and usually purple spikelets, it resembles the pilose form of *L. nigra*. It does not seem unreasonable to speculate that this variety represents a stabilized hybrid derivative between the two species. Such a hypothesis is amenable to experimental verification, but this has not yet been possible because of difficulty in growing *L. nigra* in the greenhouse.

I have tentatively assigned four Venezuelan specimens from the Distrito Federal to this variety. Chase, as indicated by her annotations, considered these to be late branching forms of *L. ruscifolia* var. *ruscifolia*. However, it is possible that the small leaves of these plants represent genetically fixed characters as they do in the Honduranian representatives of var. *velutina*. The similar inflorescences, purple spikelets, and pubescence (which is, however, less fully developed in *Fernández 127*) strengthens the resemblance to the Central American representatives of var. *velutina*. Since both *L. ruscifolia* var. *ruscifolia* and *L. nigra* occur in Venezuela, it is possible that these plants originated through independent hybridization and stabilization.

HONDURAS. DISTRITO CENTRAL: Between Suyapa and Tegucigalpa, *Molina 1811* (F, GH, US). EL PARAÍSO: Ca. 45 km E of Tegucigalpa, *Freytag s.n.* (WIS). Río Yeguare, *Molina 4051* (F, GH, US). MORAZÁN: Between San Antonio and El Zamorano, *Davidse & Pohl 2162* (ISC, MO). Vic. of El Zamorano, *Freytag 3184* (WIS); *Glassman 1732* (F, NY). Carretera Suyapa, *Molina 12837* (US). 8 km de Santa Rosa de Copán, *Molina 12880* (US). Río Rancho Quemado, *Molina 18631* (F, GH, NY). Vic. of El Zamorano, *Pohl 12508* (ISC, MO). Chagüite, *Rodríguez 384* (F). Río Yeguare, *Rodríguez 832* (F). El Pedegral, *Rodríguez 895* (F). Río Yeguare, *Standley 1056* (F). Vic. of El Zamorano, *Standley 1694* (F), 2289 (F). Río de la Orilla, *Standley 24173* (F, GH, NY, UC, US). El Jicarito, *Standley 24863* (F). Río Agua Amarilla, *Standley 26683* (F, GH, ISC, MO, US), *26686* (F, GH). Santa Inés, *Williams & Molina 10407* (F, GH, MO, NY). Río Yeguare, *Williams 16928* (F, GH, ISC, MO, WIS).

VENEZUELA. DISTRITO FEDERAL: Falda del Cerro de Pasaynaca, El Valle, *Fernández 5* (VEN), *127* (VEN). Hacienda Sosa, *Tamayo 496* (VEN), *2010* (VEN).

13. **Lasiacis scabrior** Hitchc., Proc. Biol. Soc. Wash. 40: 85. 1927. TYPE: Guatemala, Alta Verapaz, Cubilqüitz, an Waldrandern, hoch klimmend, Feb. 1913, *von Tuerckheim 4036* (US-725618, holotype; US-727020, isotype).

Perennial; culms caespitose, erect or arching and clambering over vegetation, 1–6 m tall; internodes to 13 mm thick, hollow, lignified, papillose-pubescent or puberulent especially at the apex or pubescence reduced to a line; nodes glabrous; sheaths commonly pubescent or villous with hairs to 2 mm long, sometimes becoming glabrate, the overlapping margin and throat ciliate with hairs usually 2.0–3.5 mm long; collar glabrous or with a definite line of pubescence at its base; ligule a conspicuous, usually dark brown, lacerate membrane (3.5–)4.0–6.0(–7.0) mm long, glabrous or appressed pubescent on the back, one margin usually prominently ciliolate with hairs to 3.0 mm long; blades elliptic-lanceolate to linear-lanceolate, (6–)8–12(–16) cm long, 1.0–2.2(–3.0) cm wide, the upper surface scabrid and/or puberulent along the midrib, especially toward the base, the lower surface usually densely puberulent, less commonly glabrate, the base asymmetrical, the apex acuminate, the margin scabrid; panicles (1–)4–9 cm long,

nearly spherical, the longest branch (1–)2–5 cm long, spikelet density moderate, the base of the panicle always included in the upper sheath, numerous inflorescences usually developed on the secondary branches, without a large terminal inflorescence, the branches spreading to slightly reflexed, usually pubescent or densely puberulent below, scabrid above, the pulvini puberulent to pubescent, the pedicels widely divergent at maturity; spikelets (3.5–)3.7–4.1(–4.5) mm long, obovoid; first glume (1.2–)1.7–2.0(–2.8) mm long, 7–11-nerved; second glume 9–13-nerved; sterile floret without a flower or with the rudiments of a staminate flower, the lemma 11–13-nerved, the palea ⅔ to subequal the length of the fertile floret; fertile floret 3.5–3.6 mm long, 1.8–2.0 mm wide, dark brown, with a depression on the dorsal surface, the anthers ca. 2 mm long, white, the stigmas white; caryopsis 2.1–1.3 mm long, 1.4–1.6 mm wide.

Ecology: *Lasiacis scabrior* is a plant most frequently found in clearings, along trails, and margins of wet forests. It is a grass of low to middle elevations, 0–1,100 m. The majority of spikelet-bearing plants in Central America have been collected from January to the middle of April. In the southern part of the range, they have been primarily collected later in the year.

Distribution: *Lasiacis scabrior* is known from Oaxaca and Veracruz, Mexico south through Central America, to Colombia, Ecuador, and Peru.

Lasiacis scabrior is a distinctive species, most easily recognized by its long ligules and many small, nearly spherical inflorescences that are always included in the upper sheaths. The ligule is the longest of all the erect, woody species and well surpasses those of *L. ligulata*. The inflorescence character is very distinctive. Inflorescences in all other species may occasionally be included in the sheaths, but then it is probably caused by environmental conditions. In *L. scabrior*, it is genetically fixed. *Lasiacis standleyi* also has very long ligules similar in appearance to those of *L. scabrior*. However, *L. scabrior* has large inflorescences well exserted from the sheaths. The two species have similar leaf morphology, culm pubescence, and, as already noted, ligules. On this basis, I believe these two species to be related. They probably form the closest link between the creeping and erect species of any *Lasiacis* species pair. Among the erect species, the affinity of *L. scabrior* probably lies with *L. ligulata*.

Common name: British Honduras: El Cayo, reed, *Gentle 9023*.

BELIZE. CAYO: 47 mi sect. Hummingbird Hwy., *Gentle 9023* (F, IJ, UC, US). TOLEDO: Monkey River, *Gentle 4398* (US). Edwards Rd. beyond Columbia, *Gentle 6366* (F, IJ, NY, UC).

COLOMBIA. ANTIOQUIA: Cerca Villa Arteaga, *Soto & Barkley 18C541* (COL). CAQUETÁ: Florencia, *Perez 673* (COL, US). CHOCÓ: Hydro Camp 8, *Duke 15311* (MO). Hydro Camp 6, *Duke 15342* (MO). Bahía Solano, *Killip & Garcia 33554* (COL, US), *33594* (COL, US). VALLE: Río Digua, *Cuatrecasas 13674* (F, GH, MO).

COSTA RICA. ALAJUELA: 8 km NE of Villa Quesada, *Molina et al. 17294* (US). 2 km W of La Marina, *Molina et al. 17385* (F, NY). 6–8 km S of Villa Quesada, *Molina et al. 17480* (F, UC, WIS). CARTAGO: Vic. of Turrialba, *Godfrey 66178* (US). Vic. of Pejivalle, *Standley & Valerio 47117* (US). GUANACASTE: N of Tilarán, *Standley & Valerio 45897* (US). HEREDIA: 3 km SE of Puerto Viejo, *Opler 1644* (MO). Sarapiquí, *Brolley 7465* (M, US). LIMÓN: La Lola, *Carlson 3277* (F). 6 km W of Guápiles, *Pohl & Calderón 10019* (ISC). Vic. of Guápiles, *Standley 37178* (F). Río Yurquím, *Tonduz 8527* (GH, M, US). PUNTARENAS: Palmar Sur de Osa, *Allen 5870* (ISC). 5 km W of Rincón de Osa, *Burger & Gentry*

8812 (MO). 1 mi SW of Cañas Gordas, *Croat 22274* (MO). Las Cruces, *Croat 44409* (MO). Río Agua Buena, *Liesner 1988* (MO). Near San Vito de Java, *Pohl & Davidse 10791* (ISC). 3 km NE of Quepos, *Pohl & Davidse 11692* (ISC). Between Golfo Dulce and Río Térraba, *Skutch 5391* (ISC, US). SAN JOSÉ: Vic. of San Isidro del General, *Molina et al. 18111* (F). *Pittier 3365* (US); *Skutch 2155* (GH, MO, NY, US), *3871* (GH, NY, US). PROVINCE UNKNOWN: Rodeo de Paca, *Pittier 3245* (US). Shirones, *Tonduz 9213* (US). Tsaki, *Tonduz 9492* (F, US).

ECUADOR. CHIMBORAZO: Naranjapata, *Schimpff 526* (A, F, MO). ESMERALDAS: Guadual, *Solís 12433* (F). GUAYAS: 3 km W of Bucy, *Hitchcock 20438* (US), *20523* (US). LOJA: Santiago to Zamora, *Camp 1119* (NY, US). MANABI: *Haught 2973* (UC, US). NAPO: Cerro Antisana, *Grubb et al. 1521* (US). PICHINCHA: Vic. of Santo Domingo de los Colorados, *Cazalet & Pennington 5125* (NY, UC, US); *Fagerlind & Wibon 1594* (MO); *Solís 13889* (US).

EL SALVADOR. AHUACHAPÁN: Sierra de Apaneca, *Standley 20109* (GH).

GUATEMALA. ALTA VERAPAZ: 6 km NWW of Sebol, *Contreras 4270* (US). 2.5 mi W of Cubilqüitz, *Steyermark 44350* (F). HUEHUETENANGO: Vic. of Ixcán, *Steyermark s.n.* (F). PETÉN: Trail to Tenosique, *Contreras 3327* (US).

HONDURAS. ATLANTIDA: 28 km NE of El Progreso, *Davidse & Pohl 2173* (ISC, MO). OLANCHO: Río Wampú, *Nelson & Clewell 0699* (MO).

MEXICO. CHIAPAS: Río Usumacinta, *Breedlove 33955* (MO). Río Ixcán, *Breedlove & McClintock 34090* (MO). OAXACA: Tolosito, *Williams 9572* (F, US). VERACRUZ: Hidalgotitlán, *Avendano & Avendano 13* (MO); *Dorantes 2703* (MO). Coatzacoalcos River, *Williams 8615* (F, US), *8960* (F, US).

NICARAGUA. GRANADA: Volcán Mombacho, *Baker 2454* (MO, UC, US). RÍO SAN JUAN: 20 km NE of El Castillo, *Neill & Vincelli 3573* (MO). ZELAYA: 1 mi N of Ocongwas, *Englesing 194* (F, MO, US). Colonia La Esperanza, *Vincelli 140* (MO). Colonia Manantiales, *Vincelli 231* (MO). S of Cerro Bacan, *Vincelli 311A* (MO).

PANAMA. CANAL ZONE: 12 mi from Gamboa Gate, *Croat & Sharp 13950* (MO). CHIRIQUÍ: Burica Peninsula, *Croat 22169* (MO). 1 mi E of Cañas Gordas, *Liesner 267A* (MO). COCLÉ: El Valle de Antón, *Allen 1641* (F, GH, MO, NY), *2061* (F, GH, MO, NY). Vic. of La Mesa, *Allen 2376* (US). Cerro Pilón, *Dwyer et al. 4549* (MO). Above El Valle, *Gentry 6897* (MO). 44 km N of Penomé, *Hammel 1672* (MO). 16.7 km N of Llano Grande, *Hammel 1872* (MO). COLÓN: Vic. of Río Indio, *Croat 33667* (MO). DARIÉN: Agua Fria, *Duke 10098* (MO). Mannera to mouth of Río Cuasí, *Kirkbride & Bristan 1553* (MO, NY). Vic. of Campamento Buena Vista, *Stern et al. 851* (GH, MO), *920* (GH, MO). LOS SANTOS: Azuero Peninsula, *Croat 34474* (MO). 11 mi N of Tonosí, *Tyson et al. 2977* (MO). PANAMÁ: Cerro Azul, *Calderón 2091* (US). Cerro Jefe, *Duke 9442* (MO); *Dwyer et al. 3511* (MO), *3514* (MO); *Dwyer 8479* (MO); *Gentry & Dwyer 3511* (MO). Cerro Campana, *Ebinger 340* (MO, US). San José Island, *Johnston 548* (GH, MO, US). Rd. from El Llano to Cartí-Tupile, *Kennedy & Dressler 2953* (MO). 5 mi SW of Cerro Brewster, *Lewis et al. 3376* (COL, MO, UC). Cerro Campana, *Porter et al. 4271* (MO). Cerro Jefe, *Tyson et al. 3327* (MO). Cerro Campana, *Wilbur & Weaver 11289* (MO). VERAGUAS: NW of Santa Fé, *Mori & Kallunki 4881* (MO). 6–7 km N of Santa Fé, *Nee 9778* (MO).

PERU. HUÁNUCO: Vic. of Tingo Maria, *Mathias & Taylor 3463* (US). LA MAR: Dept. Ayacucho, *Dudley 10025* (MO). LORETO: Inchua, *Soukup 3022* (F, US). SAN MARTIN: 8 km above San Antonio, *Belshaw 3615* (F, GH, MO, NY, UC, WIS).

14. **Lasiacis sloanei** (Griseb.) Hitchc., Bot. Gaz. (Crawfordsville) 57: 302. 1911.

Panicum latifolium Hamilt., Prodr. Pl. Ind. Occ. 10. 1825, non *P. latifolium* L. 1753. TYPE: Antilles, (ex. spec. Hort. Paris) Desvaux herbarium (P).

P. sloanei Griseb., Fl. Brit. W. Ind. 551. 1864. TYPE: Jamaica, Manchester, woods near Broken(horn?), Nov. 1843, *Purdie s.n.* (K, lectotype).

P. divaricatum Presl ex Griseb., Fl. Brit. W. Ind. 551. 1864, non *P. divaricatum* L., 1759, cited as a synonym of *P. sloanei* by Grisebach (1864).

Perennial; culms caespitose, erect, clambering, or climbing, 1–6 m long; internodes hollow, 4–10 mm thick in mature culms, the young leafy internodes usually with a line of puberulence, otherwise glabrous; nodes glabrous; sheaths

glabrous, ciliate on the upper margin and the throat, the auricular hairs 1.5–3.0 mm long; collar often extended somewhat, forming a pseudopetiole to 3 mm long, usually densely puberulent or short-hispid with hairs to 1.5 mm long; ligule membranous, 0.5–0.8(–1.0) mm long, ciliolate with hairs 0.3–0.6 mm long, occasionally ciliate with hairs to 1.5 mm long, the back of the ligule puberulent, rarely glabrous; blades 8–16(–18) cm long, (1.3–)1.7–4.0(–4.5) cm wide, ovate to ovate-lanceolate or lanceolate, the upper surface puberulent or scabrous at the base of the midrib or often nearly the entire length of the midrib, otherwise shiny and glabrous, the lower surface glabrous, the base asymmetrical, the apex usually abruptly acuminate, the margin scabrid; panicles 6–34 cm long, open with relatively few, short-pedicelled spikelets appressed to the inflorescence branches, the longest branch 2–15 cm long, the main branches spreading, the upper branches ascending to spreading, scabrid, the lower pulvini sometimes puberulent, otherwise glabrous; spikelets (4.0–)4.3–4.8(–5.3) mm long; first glume (1.5–)1.7–2.4(–2.6) mm long, 7–9-nerved; second glume 9–13-nerved; sterile floret with or without a staminate flower, the anthers 1.5–2.0 mm long, occasionally only rudimentary, the lemma 9–13-nerved, palea ¾ to nearly as long as the fertile floret; fertile floret 3.8–4.3 mm long, 2.2–2.6 mm wide, the anthers 1.8–2.2 mm long, white, the stigmas white; caryopsis 2.3–2.6 mm long, 1.8–2.0 mm wide, whitish; chromosome number $n = 18$.

Ecology: *Lasiacis sloanei* is primarily a species of moist, forest edges. It may also be found in recently deforested areas, shrubby secondary growth, and thickets along roadsides and fence rows. It usually occurs at low elevations. All but one record, from Tamaulipas, Mexico, are from below 1,000 m. In southern Tamaulipas, it has apparently been collected up to 1,450 m. Spikelet-bearing plants have mostly been collected from July to March, although a few specimens have been collected in the intervening months as well.

Distribution: *Lasiacis sloanei* extends from southern Tamaulipas, Mexico, south throughout Central America. I have seen no specimens from Panama and El Salvador, although the species probably occurs in both countries. In South America, this species is known from Colombia, Venezuela, and from only one collection from Ecuador. In the West Indies, it occurs on the major islands of the Greater Antilles, Cuba, Jamaica, and Hispaniola, as well as the smaller islands of Antigua in the Leeward Islands.

Panicum sloanei was described by Grisebach on the basis of two collections (*Purdie* and *Wullschlaegel* 872) from Jamaica. A lectotype has never been chosen. Consequently, I have selected the Purdie specimen at Kew as the lecto-type. I have also seen a specimen of the *Wullschlaegel* syntype from GOET, and this is also referable to *L. sloanei*.

Although Hitchcock (1920) stated that Grisebach based *Panicum sloanei* on Sloane's plate (Voy. Jam. 1: *tab. 71, fig.* 3. 1707) as well as the two afore-mentioned collections, it is more probable that Grisebach based the description on the specimens only and that he considered the specimen figured in Sloane's plate to be conspecific with *P. sloanei*. This interpretation was made by Dr. Stearn (pers. comm.) of the British Museum and is almost certainly correct since

Grisebach in the Introduction to his Flora stated that he drew up his descriptions from actual specimens and "it is but rarely that I have copied from others." Both the *Purdie* and the *Wullschlaegel* specimens have glabrous upper and lower blade surfaces, and Grisebach (1864) described *P. sloanei* as having glabrous leaves. Moreover, Dr. Launert, agrostologist at the British Museum, reports (pers. comm.) that the Sloane specimen (Herb. Sloane 2 fol. 36), upon which the Sloane plate is based, has both surfaces covered with a fine pubescence. This is further evidence that this specimen was not used by Grisebach in drawing up the description of *P. sloanei*. Dandy (1958) also noted that Grisebach had apparently not used the Sloane Herbarium in writing the Flora of the British West Indies. No pubescence is illustrated in the Sloane plate. This suggests that Grisebach examined only the plate and on this basis identified the specimen as *P. sloanei*. The plate also shows that the specimen has small spikelets and a much branched inflorescence with widely spreading pedicels. All these characteristics suggest that the specimen upon which the plate is based is not *L. sloanei*, as Hitchcock (1908) suggested, but rather *L. sorghoidea*. It is clear, therefore, that Sloane's plate and specimen do not have any value in typification of the name *P. sloanei*, even though the specific epithet suggests a connection between Sloane's plate and the taxon *L. sloanei*.

Quite a different interpretation has been made by Baum (1967) in his discussion of the application of the name *Panicum latifolium* L. Baum designated Sloan's specimen (BM) upon which Sloanes's plate was based as the holotype for *P. sloanei*. According to Baum: "The other syntype [i.e. for *P. latifolium*] is Sloane. jam. 34. hist. 1. p. 114, t. 71. f. 3, which was identified by Hitchcock as *P. sloanei* Griseb.; however, Grisebach (1864) seems to have based his new species, *P. sloanei*, on *P. latifolium jamaicense* L., which is actually Sloane's element." I have already noted that Grisebach almost certainly based his description on the two specimens from Jamaica, and on this basis, we can dismiss Baum's typification of *P. sloanei*.

On the basis of Hamilton's (1825) description of *Panicum latifolium*, I have followed Hitchcock & Chase (1917) in assigning this binomial to synonymy under *Lasiacis sloanei*. I have not seen the type which is presumably in Paris.

Lasiacis sloanei is characterized by glabrous sheaths and blades that are broad, shiny, and glabrous except for a line of puberulence or scabridity along the midrib on the upper surface. This species also has a collar that is densely puberulent or hispid, and the inflorescence is sparsely flowered with large spikelets born on short pedicels appressed to the panicle branches. The pubescence pattern of the leaf is very constant and is one of the least variable of all *Lasiacis* species. It serves as an excellent vegetative identification characteristic.

Lasiacis sloanei is most closely related to *L. divaricata*. *Lasiacis divaricata* has shorter and narrower leaves that typically lack the characteristic pubescence pattern of *L. sloanei*, smaller spikelets, smaller panicle branches that become conspicuously reflexed at maturity, pedicels that diverge widely from the panicle branches, and vigorous young culms that grow in a zigzag pattern when branching.

Occasional specimens of *L. divaricata* may duplicate the leaf pubescence

pattern of *L. sloanei*, but these can be distinguished by the other characters. Also, profusely branched plants of *L. sloanei* may rarely approach *L. divaricata* in leaf size but may be correctly identified by the other diagnostic characters.

ANTIGUA: NE of Dark Valley, *Box 119* (US).

BELIZE. BELIZE: Gracie Rock, *Croat 23912* (MO). CAYO: 41 mi Hummingbird Hwy., *Gentle 8980* (F, IJ, NY, UC, US). El Cayo, *Lundell 6433* (F, GH, NY, US). Ca. 1 mi S ot Hummingbird Hwy., *Spellman & Newey 1661* (MO). Ca. 1 mi S of Belmopan, *Spellman & Newey 1888* (MO). ORANGE WALK: Honey Camp, *Gentle 555* (GH, MO, NY, US). TOLEDO: Cero, *Gentle 6966* (US).

COLOMBIA. CUNDINAMARCA: La Vega, *García-Barriga 10638* (US). MAGDALENA: Parque Nacional Tayrona, *Kirkbride 2496* (MO). Don Amo, Santa Marta, *Smith 2145* (F, GH, MO, NY, P, US, WIS). META: Río Cüejar, *Smith & Idrobo 1534* (COL, GH, ISC, MO, NY).

COSTA RICA. CARTAGO: Turrialba, *Pittier 9056* (US); *Pohl & Calderón 10300* (ISC); *Tonduz 8319* (M, US). GUANACASTE: 30 km N of Cañas, *Pohl 12637* (US).

CUBA. CAMAGÜEY: Palo Seco, *Ekman 15319* (US). HABANA: Loma Esperá, *Ekman 653* (K). Camoa Hills, *León 766* (US). Sierra de Anafe, *León 1967* (GH). Near Cojímar, *León 1973* (US). Jamaica, *León 2603* (GH), *13657* (GH). Sierra de Anafe, *León 16670* (GH). LAS VILLAS: Vic. of Cienfuegos, *Brues s.n.* (GH, NY); *Combs 55* (F, GH, ISC, K, MO, NY, P). Vic. of Soledad, *Howard 6250* (GH, NY, US). Amaro, *León & Loustalot 9444* (NY). Vic. of Cienfuegos, *Jack 5187* (F, GH, NY); *Linder s.n.* (GH). MANTANZAS: Vic. of Mantanzas, *Britton et al. 115* (F, NY); *Britton & Wilson 121* (NY), *393* (NY); *Britton et al. 586* (NY). Boca de Canasí, *León 13171* (GH, US). Vic. of Mantanzas, *Rugel 868* (NY). ORIENTE: Mayarí Arriba, *Ekman 15851* (US). Ubero River, *Taylor 328* (NY). PINAR DEL RÍO: Loma San Gabriel, *Ekman 10557* (NY). E of Mariel, *Ekman 12853* (F, NY, US). Sierra Mendoza, *Ekman 13657* (GH). La Güira, *León 4563* (GH, US). Sierra de los Organos, *Morton 4441* (US). Sierra Mendoza, *Shafer 11147* (NY, US). Sierra de Anafe, *Wilson 11421* (NY, US).

DOMINICAN REPUBLIC. EL SEIBO: La Romana, *Ekman H12094* (GH, K, NY, US). SAN PEDRO DE MACORÍS: 23 km W of San Pedro de Marcoris, *Howard & Howard 9508* (GH, NY, US).

ECUADOR. Recreo, *Eggers 15553* (F).

GUATEMALA. PETÉN: Uaxactum, *Bartlett 12129* (ISC, US), *12199* (US). Dos Lagunas, *Contreras 1518* (IJ, US), *1689* (US). Uaxactum, *Contreras 3641* (US). Tikal, *Contreras 3683* (US), *3746* (US), *3911* (US); *Lundell 15785* (IJ, US), *16146* (US), *17150* (IJ, US). Lake Petén Itza, *Lundell 17239* (US). Tikal, *Molina 15818* (US). QUETZALTENANGO: Colomba, *Skutch 1345* (GH, US).

HAITI. GONAVE ISLAND: Anse Galette, *Leonard 3105* (GH, IJ, NY, US), *3240* (F, GH, NY, US). Vic. Etroite, *Leonard 3290* (F, GH, IJ, NY, US). Vic. of Pikmi, *Leonard 5121* (NY, US). L'ARBONITE: Vic. of Emmery, *Leonard 9466* (MO, US). L'OUEST: Port-au-Prince, *Ekman 2190* (GH, IJ, US). Pétionville, *Leonard 4883* (IJ, NY, US), *5024* (GH, IJ, US), *5054* (GH, IJ, US). NORD OUEST: Haut Pibon, *Ekman 4438* (GH, US). St. Louis du Nord, *Leonard & Leonard 14292* (GH, NY). SUD: Grand Riviere de Jeremie, *Bartlett 17498* (US). Between Anse d'Hainautt and Dame Marie, *Bartlett 17519* (US).

HONDURAS. Swan Islands, *Nelson 13* (GH). COMAYAGUA: Comayagua, *Hernández 5279* (MO). COPÁN: 4 mi E of Copán Ruins, *Molina 30776* (MO). CORTES: Río Piedras, *Molina 3541* (F, GH, MO, US). 5 km de San Pedro Sula, *Molina 3814* (F, GH, MO, US). YORO: 19 km SE of Río Viejo, *Davidse & Pohl 2200* (ISC, MO).

JAMAICA. CLARENDON: Round Hill, *Proctor 9480* (IJ). HANOVER: Green Island, *Britton & Hollick 2128* (NY). PORTLAND: 6 mi W of St. Margaret's Bay, *Wright 118* (F, NY). ST. ANDREW: Gordon Town, *Barry s.n.* (IJ). Vic. of Kingston, *Britton 2996* (NY). Below Chestervale, *Davidse & Proctor 3249* (ISC, MO). Robertsfield, *Harris 11376* (NY). Gordon Town to Flamstead, *Harris 11454* (F, GH, IJ, K, MO, NY, P, US). Bryan's Hill, *Harris 11531* (F, NY, US). Constant Spring, *Hitchcock A.G.N.H.590* (GH, MO, NY, P, US). Bog Walk, *Hitchcock s.n.* (MO); *Maxon 10502* (NY, US). Gordon Town, *Patrick 187* (IJ). ST. ANN: 14 mi S of Ocho Rios, *Davidse & Conroy 3273* (ISC, MO). ST. CATHERINE: Between Bog Walk and Spanish Town, *Hitchcock A.G.N.H.591* (F, GH, K, MO, NY, P, US). Ewarton to Linstead, *Hitchcock 9413* (US). Near Lluidas Vale, *Hunnewell 15226* (IJ). Linstead, *Hunnewell 19752* (IJ). ST. ELIZABETH: Ipswich to Black River, *Hitchcock 9606* (US). S of Gutters, *Howard & Proctor 13818* (GH, IJ). ST. JAMES: Near Montego Bay, *Maxon & Killip 1673* (F, GH, NY, US); *Ridley 35* (US). ST. THOMAS: 2.4 mi SE of Cedar Valley,

Davidse & Conroy 3264 (ISC, MO). TRELAWNY: Near Troy, *Harris 12614* (GH, K, MO, NY, US); *Hitchcock 9801* (US).

MEXICO. CAMPECHE: Tuxpeña, *Lundell 904* (F, GH, MEXU, MO, US). CHIAPAS: 50 km SW of Palenque, *Beetle M-3906* (MO). 6–12 km S of Palenque, *Breedlove 28849* (MO). 3 km W of the Chiapas-Tabasco border, *Conrad & Conrad 2986* (MO). N of Chapulhuacan, *Moore 1328* (GH, UC, US). OAXACA: 5 km S of Tuxtepec, *Conrad & Conrad 3253* (MO). 8 mi NE of Valle Nacional, *Davidse & Davidse 9732* (MO). Tuxtepec, *Miranda 4233* (MEXU). NE of Chiltepec, *Santos 3834* (NY, US). QUINTANA ROO: Tancah, *Swallen 2807* (US), *2817* (US). SAN LUIS POTOSÍ: Tamazunchale, *Fischer 37129* (GH, MO, NY, US); *Kenoyer s.n.* (MO); *Leavenworth & Leavenworth 1945* (MO, US); *Lundell & Lundell 7125* (MEXU, NY, US). Tamasopo, *Pennell 18012* (GH, US); *Pringle 3403* (US). 48 km W of Valles, *Roe et al. 203* (WIS). 52 km W of Valles, *Roe et al. 2236* (WIS). Narango–Salta de Agua, *Sohns 1395* (US), *1406* (US). TAMAULIPAS: Santa Maria de Nogales, *Martínez & Luyando F2102* (US). 18 km NW of Ocampo, *Stanford et al. 1061* (GH, MO, NY, UC, US). VERACRUZ: Sapoapan de Cabañas, *Bravo 250* (MEXU). Papantla, *Rzedowski 23370* (MEXU, WIS). YUCATÁN: Chichen Itzá, *Beetle 885* (ISC); *Swallen 2415* (US). Tizimín, *Swallen 2519* (US). Peto, *Swallen 2692* (US), *2714* (MEXU, US), *2719* (US).

NICARAGUA. CARAZO: Jinotepe, *Hitchcock 8673* (US), *8700* (US). CHONTALES: 12 km E of Villa Somoza, *Davidse & Pohl 2388* (ISC, MO). MANAGUA: Sierra de Managua, *Garnier 1531* (US).

VENEZUELA. ARAGUA: 16.3 km NW of Rancho Grande, *Davidse 3116* (ISC, MO). BOLÍVAR: El Pao Viejo, *Davidse et al. 4969* (MO). E of Miamo, *Steyermark 88189* (NY, VEN, US). DISTRITO FEDERAL: Sosa, *Tamayo 563* (VEN). LARA: Near Barquisimeto, *Saer 280* (NY, P, VEN, US). MÉRIDA: Rd. to Mijagual, *Tillett & Hönig 738-549* (MO).

15a. **Lasiacis sorghoidea** (Desv.) Hitchc. & Chase var. **sorghoidea**, Contr. U.S. Natl. Herb. 18: 338. 1917.

Panicum lanatum Swartz, Prodr. Veg. Ind. Occ. 24. 1788, non *P. lanatum* Rottb., 1776. TYPE: Jamaica, *Swartz s.n.* (S, holotype, fragment US, photograph US).

P. glutinosum Lam., Tabl. Encycl. 1: 74, *tab. 43, fig. 3.* 1791, non *P. glutinosum* Swartz, 1788. TYPE: "Amer. Merid. Insula Franciae," (P, not seen).

P. sorghoideum Desv. in Hamilt., Prodr. Pl. Ind. Occ. 10. 1825. TYPE: Porto Rico, Desvaux Herbarium No. 24 (P, holotype).

P. orinocense Willd. ex Spreng., Syst. Veg. 1: 316. 1825, pro syn. TYPE: Venezuela, Orinoco, *Humboldt*, Willdenow Herbarium (B, not seen).

P. arborescens Sieb. ex Trin., Gram. Pan. 208. 1826, "arborscentis," pro syn., non *P. arborescens* L., 1753. TYPE: Martinique, *Sieber 267* (GOET, P).

P. divaricatum L. var. *latifolium* Schlecht. & Cham., Linnaea 6: 33. 1831. TYPE: not indicated, but Mexico, *Schiede & Deppe s.n.* (MO) is *L. sorghoidea* var. *sorghoidea*; also cites "*P. orinocense* Hb. W. 18766, fol. 2.3 [B, not seen], *P. maculatum* Rchb. in Weigelt pl. Surin. exs. [not seen], *P. fuscum* Sieb. fl. Mart. exs. n. 29 [GOET, MO, P, US], *P. airoides* Sieb. Agrost. no. 120 (e nova Holandia?!)" [P], the latter two collections are *L. sorghoidea* var. *sorghoidea*.

P. maculatum Reichb. ex Schlecht. & Cham., Linnaea 6: 33. 1831, pro syn., non *P. maculatum* Aubl., 1775.

P. agglutinans Kunth, Enum. Pl. 1: 120. 1833, based on *P. glutinosum* Lam.

P. divaricatum L. var. *lanatum* Schlecht. & Cham., Linnaea 6: 33. 1831. TYPE: Jamaica, Willdenow Herbarium 18760 (B, not seen).

P. fuscum Sieb. ex Presl, Abh. Böhm. Ges. Wiss. 3: 550. 1845, pro syn. TYPE: Martinique, Flora Martin. no. 29, *Sieber* (GOET, lectotype, chosen by Hitchcock, 1920; MO, P, US, isolectotypes).

P. praegnans Steud., Pl. Glum. 1: 74. 1854. TYPE: Mexico, Oaxaca, *Buchinger s.n.* (P, lectotype, chosen by Hitchcock, 1920, fragment US, photograph US).

P. lanatum Swartz var. *sorghoideum* (Desv.) Griseb., Fl. Brit. W. Ind. 551. 1864.

P. fuscum Sieb. ex Griseb., Fl. Brit. W. Ind. 552. 1864, pro syn.

P. martinicense Griseb., Fl. Brit. W. Ind. 552. 1864, based on *P. fuscum* Sieb. ex Presl. 1845.

P. guaraniticum Speg., Anales Soc. Ci. Argent. 16: 107. 1883. TYPE: Argentina, Misiones, Posadas, March 1883, *von Gulich s.n.* (LPS, holotype, not seen).

P. divaricatum var. *agglutinaus* (Kunth) Hack. ex Sodiro, Anales Univ. Centr. Ecuador 1889: 5. 1889.

P. swartzianum Hitchc., Contr. U.S. Natl. Herb. 12: 140. 1908, based on *P. lanatum* Swartz.
Lasiacis swartziana (Hitchc.) Hitchc., Bot. Gaz. (Crawfordsville) 51: 302. 1911.
L. guaraniticum (Speg.) Parodi, Notas Mus. La Plata, Bot. 8: 95. 1943.
L. acuminata Swallen, Mem. New York Bot. Gard. 9: 267. 1957. TYPE: Venezuela, Territorio Amazonas, Great Rapids of the Orinoco, Isla Carestía at Saltos Carestía y Galio, 5 km north of Sanariapo, 100–200 m, erect to 2 m, 11 Nov. 1953, *Maguire, Wurdack & Bunting 36171* (US, holotype; NY, isotype).

Perennial; culms caespitose, 1–10 m long, erect at the base, often vigorous, arching and leaning on surrounding vegetation; internodes lignified, 5–15 mm thick, hollow, glabrous, papillose-pubescent or pubescence reduced to a single line; nodes glabrous; sheath often papillose-pubescent especially toward the apex, with hairs commonly 1.5–3.5 mm long, also puberulent or pubescent, rarely glabrate, the overlapping margin and throat ciliate, commonly with cilia 2–3 mm long, the auricular hairs usually 2.5–3.5 mm long; collar densely hispid or pilose, occasionally the hairs less prominent; ligule usually inconspicuous (0.3–) 0.5–1.5(–2.6) mm long, usually ciliate with hairs 0.5–1.0(–1.5) mm long; blades elliptic-lanceolate, lanceolate, or linear-lanceolate, rarely ovate-lanceolate, (6–) 9–19(–23) cm long, (0.6–)1.2–3.4(–4.6) cm wide, the upper surface usually puberulent, rarely more heavily pubescent, the lower surface usually velutinous, less commonly puberulent, the base often asymmetrical and often ciliate, the margin scabrid, the apex acuminate; panicle usually large and prominent, (5–)9–25(–35) cm long, the branches usually ascending, spreading at maturity, usually scabrous and/or puberulent or pubescent, the pulvini glabrous to pubescent; spikelets obovate to elliptic, usually purple when immature, (3.0–) 3.4–4.1(–4.3) mm long; first glume (1.2–)1.5–2.1(–2.7) mm long, 7–11-nerved; second glume 9–13-nerved; sterile floret without or with a staminate flower, the anthers 1.7–2.0 mm long, the lemma 9–11-nerved, the palea ½ to equal the length of the fertile floret; fertile floret 2.9–3.8 mm long, 1.7–2.3 mm wide, dark brown, indented on the dorsal surface of the lemma, the anthers 1.9–2.3 mm long; caryopsis 1.8–2.3 mm long, 1.6–1.8 mm wide; chromosome number $n = 18$.

Ecology: *Lasiacis sorghoidea* var. *sorghoidea* is most commonly found along forest edges, brushy slopes, roadsides, hedgerows, and similar secondary communities. Plants have most commonly been collected at elevations below 1,000 m, but occasionally collections have been made up to 1,800 m. Inflorescence production, especially in Central America and the West Indies, starts later (October) than in most species in the genus. Spikelet-bearing plants have usually been collected from October through May.

Distribution: This is the most common and widely distributed species in the genus. It extends from Oaxaca and Veracruz through Central and South America to Jujuy, Chaco, and Corrientes in Argentina and Rio Grande do Sul in Brazil, and in the West Indies throughout the Greater and Lesser Antilles.

See Excluded Species and Names for a discussion of *L. maculata*.

This variety is distinguished by its large, relatively long and narrow blades, pubescent sheaths, short ligules, large, rather open spreading inflorescences, usually purple spikelets, and fertile florets indented on the dorsal surface. The

plants are coarse, large, and usually have large culms which can support themselves in an upright position more easily than in any other species.

As in the majority of *Lasiacis* species, pubescence is quite variable; however, one pattern predominates throughout the range of this variety. In this type, the sheaths are papillose-hispid, the collar is densely hispid, the lower blade surface is velutinous, and the upper blade surface is puberulent to hispidulous. Beginning in the West Indies and becoming more prevalent in northwestern South America, the pubescence, especially of the sheaths, becomes less prominent, and plants with puberulent sheaths and blades may be found. In other respects, these plants confirm to *L. sorghoidea* var. *sorghoidea*. I have also noted that in Venezuela, *L. sorghoidea* tends to have narrower leaves than in most areas. Those from the Territorio Amazonas have been described as a separate species, *L. acuminata*, by Swallen (1957). These plants have more open inflorescenses, and it is possible that they should eventually be recognized as a separate variety. The relationship of var. *sorghoidea* with *L. ruscifolia* var. *ruscifolia* is taken up under that variety.

Many plants from Peru, Ecuador, and western Brazil tend to have longer ligules (1.5–2.6 mm) than plants from the northern part of the range. These plants can generally be distinguished from *L. ligulata* by their larger blades, larger inflorescences with erect to spreading, but not reflexed, branches, and usually heavier pubescence. They may be stabilized hybrid derivatives from hybridization between these species.

Most of the specimens from Paraguay and Argentina have somewhat denser inflorescences than those from the northern parts of the range. It was largely on this basis that Parodi assigned these to *L. guaranitica*. In other ways, these plants resemble *L. sorghoidea*. Consequently, I have not recognized *L. guaranitica*.

Hitchcock took a much broader view of this variety and included *L. nigra*, a separate species in this treatment.

Common names: British Honduras: Stann Creek, wild rice, *Gentle 1910*; El Cayo, rat rice, *Gentle 2196*. Costa Rica: San José, cañuela, *Jiménez 3717*. Ecuador: tundilla, *Solís 5216*. Argentina: Misiones, picauilla, *Montes 2232*; tacuapí, *Montes 2198*.

ARGENTINA. CHACO: Fontana, *Meyer 3861* (F, GH). CORRIENTES: 4 km E de Paso de la Patria, *Arbo et al. 745* (MO). Estancia Santa Teresa, *Petersen 1717* (GH, MO, NY, US). Itati, *Schinini & Mroginski 4515* (MO). Ricón Ombú Chico, *Schinini et al. 11258* (MO). Río Parana y Ayo. San Juan, *Schinini & Quarín 11540* (MO). El Perichón, *Quarín 3388* (MO). FORMOSA: Laishi, *Jörgensen 2875* (GH, MO, NY, US). 28 km al NW de Pirané, *Krapovickas et al. 19544* (MO). Puesto Porteño, *Morel 2479* (US). 2 km N de Puesto Porteño, *Morel 2505* (US). Ruta 86 al Norte, *Morel 5783* (US). Costa Alegre, *Morel 7088* (US). Pilagé, *Morel 7415* (US). 2 km NE of Suerte Angelito, *Morel 7897* (US). 2 km de la frontera, *Morel 8404* (US). Laguna Verá, *Morel s.n.* (US, WIS). JUJUY: Caliligua, *Hunziker 1975* (GH, US). MISIONES: Puerto Leoni, *Cabrera et al. 243* (US). Alto Paraná, *Ekman 617* (US). Loreto, *Ekman 619* (US). Caraguatay, *Montes 1592* (US). La Mina–San Juan, *Montes 2198* (F, US). Puerto Aguirre, *Parodi 4410* (US). Santa Ana, *Rodríguez 258* (GH, NY, US). San Juan, *Schwindt 297* (US, WIS). Mineral, *Schwindt 683* (ISC, MO).

BELIZE. CAYO: Below El Cayo, *Bartlett 11960* (US). El Cayo, *Bartlett 12954* (GH, NY, US). Vaca, *Gentle 2196* (F, GH, US). STANN CREEK: Stann Creek-Mullin's River Rd., *Gentle 1910* (GH, NY, US). Near Hope Creek, *Gentle 7873* (F, IJ, NY, UC). Sapan Rd., *Gentle 8118* (F, IJ, NY, UC, US). 12 mi sect., Stann Creek-Middlesex Rd., *Gentle 9331*

(F, UC, US). TOLEDO: 15 mi sect., Punta Gorda-San Antonio Rd., *Gentle 6945* (F, NY, UC, US).

BOLIVIA. COCHAMBA: Vic. of Cochamba, *Bang 1289* (F, GH, ISC, MO, NY, US), *1291* (US). Espiritu Santo, *Buchtien 161* (F, GH, MO, NY). Cochamba, *Buchtien 2500* (US). LA PAZ: Mapiri, *Buchtien 10* (NY, US), *88* (US). Polopolo bei Coroico, *Buchtien 3635* (MO, US). Millugaya, *Buchtien 4271* (GH, NY, US). San Antonio bis Mapiri, *Buchtien 6442* (US). Chuluman, *Hitchcock 22652* (US). SANTA CRUZ: E of Puerto Suarez, *Chase 11154* (US). Ascensión de Guarayos, *Krapovickas & Schinini 31748* (MO). Canton Buena Vista, *Steinbach 1931* (GH, US), *5551* (F, GH, NY), *7111* (F, GH, MO, NY, UC, US). San Juan, *Williams 960* (NY).

BRAZIL. ACRE: Bôa Vista, *Black 51-12665* (US). AMAPÁ: Rd. to Amapá, *Pires & Cavalcante 52138* (MO, US), *52169* (MO, US). AMAZONAS: Tabatinga, *Pires & Black 852* (RB, US). BAHIA: Ca. 4 km N of Barreiras, *Irwin et al. 31599* (MO). CEARÁ: Crato, *Swallen 4354* (US). DISTRITO FEDERAL: Parque Nacional de Gama, *Clayton 4977* (NY). 10 km S of Brasilia, *Irwin et al. 12268* (US). 3 km S of Sobradinho, *Irwin et al. 15453* (US). Catetinho, *Sucre 310* (RB). GOIÁS: 2 km W of Monte Alegre de Goiás, *Anderson 6950* (MO). Serra do Caiapó, *Anderson 9491* (MO). Ca. 17 km S of Goiás Velho, *Anderson 9923* (MO, RB). Serra Dourada, *Irwin et al. 11884* (MO). Araguaína, *Irwin et al. 21180* (MO, US). Goiás, *Macedo 3734* (US). MARANHÃO: Fazenda Vitoria, *Pires & Black 16962* (NY). Barra do Gorda to Grajahu, *Swallen 3623* (US). Carolina, *Swallen 3888* (RB, US). MATO GROSSO: Ca. 30 km ENE of Barra do Garças, *Anderson 9777* (MO). Ca. 5 km N of Barra do Garças, *Anderson 9878* (MO). Tres Lagos, *Chase 10753* (US). Vic. of Dourados, *Chase 10986* (GH, MO), *11019* (GH, US). Corumbá, *Chase 11129* (F, US). Santa Rita do Araguaya, *Chase 11821* (NY, RB, US). 30 km S of Xavantina, *Harley & Souza 11074* (MO, RB, US). 85 km from Xavantina, *Hunt & Ramos 5673* (NY, US). Serra do Roncador, *Irwin et al. 16309* (MO, US). Ca. 96 km S of Xavantina, *Irwin et al. 17395* (MO, US). Novos, *Kuhlmann 1748* (RB). Poaia territoria, *Lindman 3185* (US). Cuyabá, *Malme 1544B* (US), *1723* (GH, US). Corumbá, *Malme 3053* (GH, US). Rondonopolis, *Kuhlmann 2565* (RB). Ca. 270 km N of Xavantina, *Ratter et al. 2120* (MO, RB). Munic. de Maracajú, *Sucre 10498* (RB). MINAS GERAIS: 2 km from Mendanha, *Anderson 8787* (MO). Serra do Espinhaço, *Anderson et al. 36296* (MO). Between Uberlandia and the Rio Paranahyba, *Chase 11618* (US). Visçosa, *Kuhlmann 162* (RB). Santa Luzia, *Roth 1202* (RB). 7 km S of Belo Horizonte, *Williams & Assis 7136* (F, GH, MO, NY, UC, US). PARANÁ: Barra da Felicidade, *Hatschbach & Haas 16608* (MO, UC). Umuarama, *Hatschbach 13301* (F). Parque Nacional de Iguaçú, *Pereira 5374* (RB, US). Cascavel, *Rambo 53497* (US). RIO DE JANEIRO: Reserva Florestal de Itatiaia, *Braga 2465* (MO). San Pedro, *Chase 10152* (US). Rio de Janeiro, *Delforge s.n.* (RB). Petrópolis, *Sucre & Braga 2649* (MO). SÃO PAULO: Itapira, *Hoehne 20294* (GH, US). Campinas, *Novaes 1237* (US), *1238* (US); *Santoro 617* (US).

COLOMBIA. AMAZONAS: Between Marco and Leticia, *Black & Schultes 4651* (US). Loretoyaca River, *Schultes 6006* (GH). ANTIOQUIA: Vic. of Medellín, *Alfaro 31* (US). Sonsón, *Archer 399* (US). Fredonia, *Archer 522* (US). Granja de las Mercedes en Venecia, *Barkley & Gutiérrez 1652* (US). Vic. of Dabeiba, *Barkley & Gutiérrez 1816* (UC, US), *1831* (US). San Luis de Cocorna, *Castañeda 10076* (NY). Between Argelia and Alto de Tigre, *Core 805* (US). Peñas Blancas, *Juzepczuk 4616* (US). Malena, *Pennell 3776* (NY). Fredonia, *Tomas 892* (US). Vic. of Medellín, *Toro 100* (NY), *399* (US). ATLANTICA: Los Pendales, *Dugand & Barriga 2548* (US); *Dugand 4195* (US). BOLÍVAR: Vic. of Turbaco, *Killip & Smith 14681* (GH, NY, US). Sincelejo, *Pennell 4062* (NY, US). Frasquillo, *Pennell 4605* (NY, US). CALDAS: Pueblo Rico, *Sneidern 5224* (US). CAQUETÁ: Sucre, *Cuatrecasas 9085* (US). 55 km SE of Guadalupe, *Davidse et al. 5629* (MO). 10 km SW of Belen, *Davidse et al. 5690* (MO). 8 km SW of San Juan del Fragua, *Davidse et al. 5727* (MO). Morelia, *Soderstrom 1407* (US). CHOCÓ: Río San Juan, *Cuatrecasas 16936* (F, US). Andagoya, *Killip 35492* (US). Mun. de Río Sucio, *León 643* (MO). CUNDINAMARCA: *Cuatrecasas 9624* (US). 20 km NW of Villavicencio, *Davidse & Llanos 5522* (MO). 8 km de Apulo, *Forero & Garzón 269* (MO). 15 km NW of Guaduas, *Gentry et al. 18122* (MO). Below Cachipay, *Gutiérrez 128* (NY, US). Fusagasuga, *Juzepczuk 5388* (US). N of Apulo, *Killip et al. 38230* (US). Perrero, *Woronow & Juzepczuk 4868* (US). HUILA: Mun. de Garzón, *Bermudez 34933* (F, MO). 6 km SE of Altamira, *Davidse et al. 5585A* (MO). 10 km SE of Guadalupe, *Davidse et al. 5605* (MO). MAGDALENA: Camino de la Gran Via a San Pedro, *Romero-Castañeda 10663* (MO). Santa Marta, *Smith 2147* (MO), *2148* (F, GH, MO, NY, P, US), *2258* (ISC, MO, P), *2531* (F, GH, NY). META: Río Meta, Cubarral, *Cuatrecasas*

4447 (US). Villavicencio, *Cuatrecasas 4516* (F, US). Entre ríos Ariari y Meta, *Cuatrecasas 7815* (F, US). E of Puerto López, *Davidse & Llanos 5469* (MO). 4 km NW of Villavicencio, *Luteyn et al. 4799* (MO). NORTE DE SANTANDER: Near Río Zulia, *Barkley et al. 18NS070* (US). Confluence of Río Cabugón and Cabaria, *Cuatrecasas 13144* (US). Between Chinacota and La Esmeralda, *Killip & Smith 20901* (US). PUTUMAYO: Piñuña Neguro, *Cuatrecasas 10699* (F, US). SANTANDER: Between Nariño and El Tambor, *Killip & Smith 14952* (US). N slope of Mesa de los Santos, *Killip & Smith 14992* (F, GH, NY, US). Near Bucaramanga, *Killip & Smith 16211* (GH, NY, US). NW of Bucaramanga, *Killip & Smith 16302* (GH, NY, US). Río Magdalena, *Pennell 3916* (F, GH, MO, NY, US). TOLIMA: Libano, *Pennell 2936* (NY, US), *3225* (NY), *3237* (GH, MO, NY, US), *3296* (NY). 5 km W of Chaparral, *Smith 1295* (GH, ISC, UC, US). VALLE: Río Digua, *Cuatrecasas 15069* (F, US). La Cumbre, *Cuatrecasas 19617* (F, US). Río Cali, *Cuatrecasas 18626* (F, US). Cali, *Cuatrecasas 25693* (US). Ansermanuevo, *Forero et al. 3587* (MO). N of Palmira, *García-Barriga 6458* (US). Cali, *Fosberg 21990* (US). Cisneros, *Killip 35542* (US). E of Zarzal, *Pennell et al. 8567* (GH, NY, US), *8573* (GH, US). VICHADA: Ca. 8 km E of Las Gaviotas, *Davidse & Llanos 5165* (MO). Ca. 35 km E of Las Gaviotas, *Davidse & Llanos 5198* (MO). VAUPÉS: Near Miraflores, *Grasel 10047* (US).

COSTA RICA. ALAJUELA: La Calera de San Ramón, *Brenes 6432* (F). Carrillos de Poás, *Brenes 14620* (F, NY). Entre Itiquis y Poás, *Brenes 17331* (F, NY). Carrillos de Poás, *Brenes 17382* (F, NY), *19416* (F, NY). Valley of the Río Itiquis, *Pohl & Davidse 12544* (ISC, MO). CARTAGO: Vic. of Pejivalle, *Skutch 4631* (F, GH, NY, MO, US). Atirro, *Smith 4991* (GH, US). Vic. of Pejivalle, *Standley & Valerio 46876* (US), *47060* (US), *47168* (US). GUANACASTE: Santa Rosa National Park, *Liesner & Lockwood 2416* (MO). Nicoya, *Tonduz 13755* (GH, US). PUNTARENAS: Near Quepos, *Burger et al. 10554* (MO). Osa Peninsula, *Cufodonti 180* (US); *Godfrey 66850* (US). Boruca, *Pittier 4455* (US). SAN JOSÉ: 5 km SW of San Isidro, *Jiménez 3717* (F, MO); *Molina et al. 18018* (F, MO). Vic. of El General, *Skutch 2189* (GH, MO, NY, US), *3817* (F, GH, US), *3875* (GH, MO, NY, US), *3876* (GH, MO, NY, US). Cordillera de Talamanca, *Williams et al. 28449* (F, MO).

CUBA. LAS VILLAS: Trinidad Mts., *Gonzáles 469* (A, MO). ORIENTE: Rd. to El Caney, *Clemente 5690* (GH). Sierra de Nipe, *Ekman 10095* (F, NY, US), *10108* (NY, US). Papayo, *Ekman 10318* (US). Sierra Maestra, *Ekman 10324* (US). SANTIAGO: Cuabitas, *Hamilton 218*(NY). SANTA CLARA: Hoya de Manicaragua, *Britton et al. 4694* (NY). Trinidad Mts., *Brues s.n.* (GH, NY). San Blas, *Jack 6443* (US), *7053* (GH, NY). Banao Mts., *Luna 1004* (NY), *1007* (NY), *1008* (NY). Rincón to Banao, *Shafer 12323* (F, NY, US).

DOMINICAN REPUBLIC. BARAHONA: NW of Barahona, *Howard 12237* (GH, IJ, NY). LA VEGA: Jarabacoa, *Augusto 936* (NY). 12 km S of La Vega, *Davidse 2680* (MO). Constanza, *Jiménez 2123* (US). SAMANÁ: Vic. of Sánchez, *Abbott 181* (US). Vic. of Laguna, *Abbott 332* (US). SÁNCHEZ RAMÍREZ: Cotuy, *Abbott 737* (US). SAN JUAN: Piedra del Aguacate to Río del Oro, *Howard & Howard 9454* (GH, NY). SANTIAGO: Vic. of Santiago, *Allard 14557* (A, US). La Cumbre, *Jiménez 982* (US). SANTO DOMINGO: Vic. of Ciudad Trujillo, *Allard 13452* (NY, US), *13574* (US), *14157* (MO), *14457* (US), *14788* (US), *17941* (US). Llano Costero, *Ekman 11157* (A, US), *14219* (US).

ECUADOR. CHIMBORAZO: Near Huigra, *Camp 3039* (F, GH, NY, UC, US); *Hitchcock 20607* (US); *Rose & Rose 22184* (GH, NY, US). EL ORO: Between Santa Rosa and La Chorita, *Hitchcock 21146* (US). Between La Chorita and Portovelo, *Hitchcock 21196* (US). Near Santa Rosa, *Mexia 6725* (UC, US). Vic. of Portovelo, *Rose & Rose 22401* (US), *23374* (US). ESMERALDAS: Lita, *Jativa & Epling 889* (NY). Concepción and Guimbicito, *Solís 19720* (US). GUAYAS: 4 km W of Guyaquil, *Asplund 5802* (US), *5810* (US). Guayaquil, *Hitchcock 20133* (GH, NY, US), *20158* (US), *20236* (GH, NY, US). Milagro, *Hitchcock 20295* (GH, NY, US). Cerro de Isera, *Jativa & Epling s.n.* (NY). IMBABURA: Lita, *Solís 12142* (US). LOS RÍOS: Río Rita, *Asplund 5496* (NY). Río Palenque Biological Station, *Dodson 5821* (MO). 21 km S of San Carlos, *Gentry 9992* (MO). Vic. of Montalvo, *Holm-Nielsen et al. 2605* (AAU). Pichilingue, *Solís 10696* (F, US). Rd. from Napo to Puyo, *Ellenberg 3281* (MO). NAPO: Lago Agrio Airport, *Gentry 9835* (MO). PASTAZA: Vic. of Puyo, *Skutch 4392* (A, F, MO, NY, US). Arajuna, *Solís 9773* (US). SANTIAGO ZAMORO: Near Mendez, *Camp E-911* (NY, US). TUNGURAHUA: Between Baños and Cashurco, *Hitchcock 21775* (US), *21806* (US), *21808* (US). Río Mapato and Río Pastaza, *Penland & Summers 193* (F, GH). Near Baños, *Solís 10263* (F, US).

EL SALVADOR. SAN SALVADOR: Tonacatepeque, *Calderón 509* (GH, NY, US). Lomas de Candelaria, *Calderón 2514* (F, US). W side of Lake Ilopango, *Hitchcock 8921* (US). Vic. of San Salvador, *Standley 23117* (US).

FRENCH GUIANA. Saül, *Hoock 91* (CAY). Route de Kourou, *Hoock 325* (CAY, NY).

GUATEMALA. BAJA VERAPAZ: Sierra de las Minas, *Kellerman 6233* (US). IZABAL: Los Amates, *Deam 10* (F, GH, NY); *Kellerman 4786* (US), *7472* (US). Between Los Amates and Quiriguá, *Steyermark 38328* (F). PETÉN: Dolores, *Contreras 2283* (US). Between Río San Diego and San Diego, *Steyermark 45402* (F, US). RETALHULEU: Retalhuleu, *Bernoulli & Cario 885* (GOET), *953* (GOET). 5 km W of Retalhuleu, *Standley 87374* (F). Vic. of Retal, *Standley 88733* (F). ZACAPA: 13 km E of El Lobo, *Harmon & Fuentes 1857* (MO). Piedra Blanca de Gualán, *Pittier 1787* (US).

GUYANA. Rupununi, *Cook 173* (A, US). Kanuku Mts., *Smith 3314* (F, GH, MO, NY, US).

HAITI. L'ARTIBONITE: Vic. of Mission, *Leonard 3654* (NY), *3670* (IJ, NY, US), *3976* (NY, US). Vic. of Kalacroix, *Leonard 7910* (MO, US). Vic. of Ennery, *Leonard 9042* (NY, US). Marmelade, *Nash & Taylor 1252* (NY). NORD: La Victoria, *Holdrige 1738* (NY). St. Michael de l'Atalaye, *Leonard 7158* (GH, US), *7606* (US), *7776* (F, GH, NY, US), *8475* (US). Vic. of Plaisance, *Leonard 9282* (US), *9352* (US). Vic. of Pitala, *Leonard 9668* (IJ, US). NORD OUEST: St. Louis du Nord, *Leonard & Leonard 14197* (GH, NY, US). OUEST: Port-au-Prince, *Ekman H2224* (A, IJ, US). Vic. of Furcy, *Leonard 4563* (US).

HONDURAS. ATLANTIDA: 17 km SSE of La Ceiba, *Davidse & Pohl 2197* (ISC, MO). PARAÍSO: Danlí to Finca La Emilia, *Carlson 2568* (F). Vic. of Danlí, *Standley 16392* (F).

JAMAICA. CLARENDON: 1.25 mi WSW of Kellits Post Office, *Proctor 24633* (IJ). HANOVER: Lucea, *Hitchcock s.n.* (MO). MANCHESTER: New Forest, *Hitchcock 9837* (US), *9892* (US), *9893* (UC, US). Somerset Woods, *Proctor 16025* (IJ). Walderston, *Proctor 22915* (IJ). PORTLAND: Spring Hill, *Adams 9890* (M). Port Antonio, *Hitchcock s.n.* (MO, US); *Rothrock 420* (F, NY). ST. ANDREW: Silver Hill, *Davidse & Proctor 3247* (ISC, MO). Above Gordon Town, *Davidse & Proctor 3250* (ISC, MO). Mt. Lebanon, *Harris 12488* (F, GH, MO, NY, US). Gordon Town, *Hart 685* (NY, US); *Hitchcock 9380* (US), *9382* (US). Mt. Charles Dist., *Proctor 9626* (IJ, NY, US). St. Andrew, *Perkins 1138* (GH). Rd. to Bellevue, *Yuncker 17407* (F, MO). ST. ANN: Moneaque, *Adams 10022* (MO). ¾ mi NE of Faith's Pen Post Office, *Howard & Proctor 14990* (A, IJ). Mt. Diablo, *Ridley 24* (US). ST. CATHERINE: 4 mi S of Ewarton, *Adams 8946* (MO). Lluidas Vale, *Hunnewell 15227* (IJ). ST. JAMES: Flamstead, *Harris 11469* (F, GH, NY, US). Near Montego Bay, *Ridley 34* (US). ST. THOMAS: St. Thomas, *Britton 4045* (NY). Rd. to Landewey, *Davidse & Conroy 3257* (ISC, MO). 2.4 mi SE of Cedar Valley, *Davidse & Conroy 3266* (ISC, MO). Below Penlyne Castle, *Proctor 9588* (IJ). Above Bath Fountain, *Proctor 9792* (IJ). Between Easington and Llandewey, *Proctor 24239* (IJ). Vic. of Creighton's Hall, *Proctor 24243* (IJ). TRELAWNY: Troy, *Harris 12650* (F, GH, MO, NY, US); *Hitchcock 9808* (US), *9817* (US).

LEEWARD ISLANDS. ANTIGUA: Christian Valley, *Box 115* (US). Boggy Peak, *Rose et al. 3453* (NY, US), *3484* (NY, US). Fig Tree Hill, *Rose et al. 3493* (NY, US), *3647* (US). GUADELOUPE: *Duss 3182* (NY), *3183* (F, GH, MO, NY, US), *2683* (NY), *3613* (NY, US). Alymes, *Questel 4803* (P). Basse-Terre, *Sastre et al. 2539* (MO). Near St. Claude, *Stehlé 112* (US), *113* (US). Malanga, *Stehlé 1945* (GH, US). MONTSERRAT: Above Salem, *Proctor 18854* (A). Chancers Mtn., *Shafer 253* (F, NY, US), *255* (F, NY, US). Blakers, *Shafer 701* (F, NY, US). ST. KITTS: *Box 160* (NY); *Hitchcock 16353* (US).

MEXICO. CHIAPAS: 15 km SW of Suchiapa, *Breedlove 28079* (MO). Near Laguna Miramar, *Sohns 1604* (US), *1617* (US). OAXACA: Yaveo, *Mexia 9252* (MO). N of Tuxtepec, *Nelson 372* (US). VERACRUZ: Córdoba, *Bourgeau 1459* (P). Zacuapan, *Purpus 6206* (F, MO, NY, US).

NICARAGUA. CARAZO: Jinotepe, *Hitchcock 8674* (US), *8690* (GH, UC, US). CHONTALES: Near Santo Domingo, *Bunting & Licht s.n.* (F, NY); *Narvaez 3356* (MO). MATAGALPA: 6–10 km NE of Matagalpa, *Williams et al. 24032A* (F). 15 km NE of Matagalpa, *Williams et al. 27506* (F, MO, NY). ZELAYA: El Recreo, *Long 243* (F). Vic. of El Recreo, *Standley 19303* (F), *19518* (F). Vic. of Wani, *Stevens 7214* (MO).

PANAMA. BOCAS DEL TORO: Vic. of Chiriquí Lagoon, *von Wedel 1856* (GH, MO, US). CANAL ZONE: Summit, *Allen 2281* (MO, NY, US). Between Miraflores and Panamá, *Blum 2059* (MO). Colón–Empire, *Crawford 451* (NY). Barro Colorado Island, *Croat 4259* (MO, NY), *7474* (MO), *8009* (MO), *12942* (MO). Near Summit, *Croat 12791* (MO, US). N of Paraíso, *Croat 12974* (MO). Gamboa, *Croat 14603* (MO, US). Near Paraíso, *Dwyer 7150* (GH, MO, NY). Chagres, *Fendler 371* (MO). Balboa, *Greenman & Greenman 5052* (MO, US). Gatún Lake, *Hitchcock A.G.N.H.416* (MO), *A.G.N.H.417* (F, GH, MO, NY, US). Pedro Miguel, *Hitchcock 7955* (US). Gatún, *Hitchcock 9177* (UC). Las Cruces Tunnel, *Hunter & Allen 760* (GH, MO). Fort Kobbe, *Morton s.n.* (MO). Near Culebra, *Pittier*

2118 (NY). Between Corozal and Miraflores, *Pittier 2196* (NY). Summit, *Popenoe 26* (F, NY, US). Gatún Lake, *Popenoe 47* (F, NY). Barro Colorado, *Shattuck 528* (F, MO). Balboa, *Standley 25452* (GH). Near Culebra, *Standley 25955* (US). Balboa, *Standley 26065* (MO), *29319* (NY, US). Fort Clayton, *Tyson & Blum 3902* (MO). Near Miraflores Lake, *Tyson & Blum 4011* (MO); *White 56* (MO). CHIRIQUÍ: Burica Peninsula, *Croat 21968* (MO), *22020* (MO), *22050* (MO). Paso Canoas to Cañas Gordas, *Croat 22209* (MO). Burica Peninsula, *Croat 22513* (MO), *22553* (MO). 7 km W of Puerto Armuelles, *Croat 35016* (MO). 1 mi E of Cañas Gordas, *Liesner 267* (MO). 17 km NE of San Felix, *Nee 10759* (MO). COCLÉ: Río Mata, *Allen 142* (A, MO, US). 1.2 km N of El Cope, *Hammel 977* (MO). 178 km W of Panamá City, *Folsom 6890* (MO). 4 mi W of Antón, *Tyson & Blum 2598* (MO). COLÓN: Puerto Pilón, *Allen 4102* (F, NY). DARIÉN: Río Pinas, *Duke 10569* (MO). Isla Casaya, *Duke 10877* (MO). LOS SANTOS: 12 mi S of Macaracas, *Tyson et al. 3078* (MO). 16 mi S of Macaracas, *Tyson et al. 3096* (MO). PANAMÁ: 1 mi E of Tocumen Airport, *Blum & Tyson 1962* (MO). Santa Rita Ridge, *Correa 885* (MO). N of Buenos Aires, *Croat 12924* (MO, US). 3 km S of Alcalde, *Díaz 8857* (MO). Beginning of El Llano-Cartí Rd., *Dwyer & Nee 11994* (MO). Isla Bayano, *Garibaldi 81* (MO). Near Río Boquerón, *Hammel 894* (MO). San José Island, *Johnston 1078* (GH, US), *1272* (GH, US). El Llano-Cartí Rd., *Nee & Dwyer 9251* (MO). Matías Hernández Exp. Sta., *Pittier 6924* (GH, NY). Near Panamá, *Standley 26780* (GH), *29720* (US). Between Las Sabanas and Matías Hernández, *Standley 31837* (US). Between Matías Hernández and Juan Díaz, *Standley 32022* (US). Los Pozos–Chame, *Troetsch 22* (MO). SAN BLAS: Mulatuppa, *Duke 8530* (MO). VERAGUAS: Between Cañazas and the Cordillera Central, *Allen 176* (MO, US). 5 mi NW of Santa Fé, *Croat 23187* (MO). S of Santa Fé, *Nee 8054* (MO), *8106* (MO). 5 km S of Santa Fé, *Nee 8136* (MO). 2 km NW of Atalaya, *Nee 8201* (MO). 6–7 km N of Santa Fé, *Nee 9836* (MO). Cerro San Cristobal, *Nee 10158* (MO).

PARAGUAY. ALTO PARANÁ: Pte. Franco, *Bertoni 1413* (NY). Alto Paraná, *Fiebrig 6014* (GH, US), *6134* (GH, M). Nacunday, *Montes 10995* (US). BOQUERÓN: Gran Chaco, *Hassler 2868* (P). Puerto Casado, *Rojas 2722* (US). CAAGUAZÚ: Vic. of Caaguazú, *Hassler 9143* (GH, NY, P, UC). CETRAL: Yaguarón, *Arenas 1197* (MO). L'Assumption, *Balansa 40* (GOET, P). Cordillera de Altos, *Hassler 3731* (NY). Near Ypacaray, *Hassler 12514* (MO, NY, UC, US). Near Sapucay, *Hassler 13015* (US). Asunción, *Morong 641* (GH, MO, NY, US). Near Asunción, *Morong 755* (GH, MO, NY, US). Near Asunción, *Morong 780* (NY). Villa Elisa, *Pedersen 5899* (A). Asunción, *Schinini 4728* (ISC, MO). CONCEPCIÓN: Between Río Apa and Río Aquidaban, *Fiebrig 4710* (GH). SAN PEDRO: Alto Paraguay, *Woolston G-87* (GH, NY, UC), *G-146* (NY, UC).

PERU. AMAZONAS: Río Cenepa, *Ancuash 452* (MO), *562* (MO), *677* (MO). Huampami, *Berlin 1966* (MO). Río Cenepa, *Kayap 744* (MO). Quebrada Satik, *Kayap 1096* (MO). Valley of Río Marañon, *Wurdack 1806* (US). AYACUCHO: Estrella, *Killip & Smith 22646* (F, GH, NY, US). Near Kimpitiriki, *Killip & Smith 22910* (NY, US). Estrella, *Killip & Smith 30674* (NY, US). CUZCO: Wajyumbe, *Vargas 720* (US). Quince Mill, *Vargas 9557* (US). HUÁNUCO: Pozuzo, *Macbride 4563* (F, US), *4571* (F, GH, US). Dist. Churubamb, *Mexia 8233* (F, GH, MO, NY, UC, US). JUNÍN: Near San Ramón, *Constance & Tovar 2240* (UC). Montayaco, *Gentry & Prance 16430* (MO). Colonia Perene, *Hitchcock 22118* (US), *22120* (US), *22122* (US), *22125* (US), *22502* (US), *22503* (US), *22504* (GH, US). La Merced, *Killip & Smith 23438* (F, NY, US). Río Pinedo, *Killip & Smith 23641* (NY, US). La Merced, *Killip & Smith 23998* (F, NY, US). Puerto Bermudez, *Killip & Smith 26441* (F, NY, US). La Merced, *Macbride 5298* (F, GH, NY, US). LORETO: Above Yurimaguas, *Croat 18083* (MO). Balsapuerto, *Killip & Smith 28673* (F, NY, US). Río Corrientes, *McDaniel & Marcos 11097* (MO), *11137* (MO). Near mouth of Río Nanay, *Rimachi 416* (MO). Pebas, *Williams 1782* (F, US). Lower Río Huallaga, *Williams 3918* (F, US), *4359* (F, US), *4939* (F, US), *5216* (F, US). MADRE DE DIOS: Puerto Maldonado, *Chávez 1807* (MO), *1810* (MO). Huancabamba, *Ferreyra 10793* (US). SAN MARTIN: Vic. of Tarapate, *Ferreyra 7876* (US). Juanjuí, *Klug 4372* (F, GH, MO, NY, UC). Tocache Nuevo, *Schunke 7467* (MO), *8241* (MO). San Roque, *Williams 7184* (F, US).

PUERTO RICO. Mt. Morales, *Britton & Cowell 443* (NY). Cuayara-Cayey Rd., *Britton et al. 6450* (NY). Vic. of Arecibo, *Chase 6457* (NY, US). Sierra de Luquillo, *Chase 6728* (US). Vic. of Mayagüez, *Chase 6809* (ISC, NY, US), *6822* (US), *6823* (US). Mariacao, *Duke 7362* (MO), *7580* (MO), *7607* (MO). 2 mi NE of Mayagüez, *Heller 4375* (F, GH, MO, NY, P). San German, *Hess 75* (US). Near Mayagüez, *Holm 74* (F, GH, MO, US), *116* (US). Río Piedras, *Otero 322* (MO). Luquillo, *Otero 510* (F, MO). Lares, *Sargent*

1381 (IJ). Mancao, *Sargent 13114* (US). Encata, *Shafer 2570* (NY, US). Coamo, *Sintensis 3062* (GH, GOET, P, US). Río Piedras, *Stevenson 2470* (F, NY). Yauro, *Velez 868* (NY).

SURINAM. Lely Mts., *Mori & Bolten 8486* (MO).

TOBAGO. Parlatuvier-Roxborough Trace, *Cowan 1481* (NY, UC, US). Speyside, *Hitchcock 10247* (US).

TRINIDAD. Caparo, *Broadway 4924* (US). St. Francique, *Broadway 4976* (RB, US). St. Ann's Cascade, *Broadway 5170* (A, F, ISC, MO). Rd. to Blue Basin Diego Martin, *Broadway 5873* (GH, MO). Aripo Rd., *Broadway 5991* (US). Maraval, *Broadway 7067* (F, MO, US). Maracas, *Broadway 7233* (MO). Moruga–La Fortune, *Broadway 7579* (US). Blanchisseuse Rd., *Broadway 7666* (MO). St. Anns, *Broadway 9164* (A, MO, US). Carcuage Main Rd., *Broadway 11286* (NY). Heights of St. Ann, *Britton et al. 665* (GH, NY). 1 mi W of Arima, *Davidse 2446* (ISC, MO). Northern Range, *Davidse 2460* (ISC, MO). 6 mi N of Port of Spain, *Davidse 2561* (ISC, MO). St. Anns, *Hitchcock A.G.N.H.594* (F, GH, MO, NY, US). Port of Spain, *Hitchcock 9950½* (US), *9963* (US), *9980* (US). Chacachacare, *Hitchcock 10061* (US), *10064* (US). Tabaquite, *Hitchcock 10131* (US). St. Joseph, *Hitchcock 10170* (US).

VENEZUELA. ARAGUA: El Castano, *Chase 12449* (US). Parque Nacional, *Chase 12454* (US, VEN), *12472* (GH, NY, US, VEN). Maracay, *Cornelia 78* (NY, US, VEN). Río Guayas, *Curran s.n.* (VEN). 19.8 km S of Carayaca, *Davidse 2902* (MO). Rancho Grande, *Davidse 3047* (MO). 7.4 km S of Alto de Choroní, *Davidse 3087* (MO). Ca. 5 km S of Alto de Choroní, *Davidse 3103* (MO). Colonia Tovar, *Fendler 1620* (GH, MO), *1631* (GH, MO). Vic. of Maracay, *Pittier 14968* (US, VEN). Parque Nacional, *Pittier 15278* (US, VEN). Between La Victora and El Consejo, *Williams 11026* (F, US). AMAZONAS: 12.5 km S of Puerto Ayacucho, *Davidse 2785* (ISC, MO, VEN). 20 km S of Puerto Ayacucho, *Davidse 2839* (ISC, MO, VEN). Ca. 5 km NNW of Sanariapo, *Davidse 2875* (ISC, MO, VEN). APURE: 42 km NW of Achaguas, *Davidse et al. 3923* (MO). BARINAS: Barinas, *Angelo 1077* (VEN). Near Barinitas, *Breteler 3417* (MO, NY, RB, US). 31 km NW of Mérida intersect., *Davidse 3184* (ISC, MO). 43 km NW of the Mérida intersect., *Davidse 3194* (ISC, MO). BOLÍVAR: La Gran Sabana, *Davidse et al. 4772A* (MO), *4782* (MO). El Pao Viejo, *Davidse et al. 4968* (MO). Between La Paragua and El Cristo, *Killip 37706* (US). Altiplanicie de Nuria, *Ramia 2260* (VEN). Salto Para, *Tillett 763-119* (MO). E of Miamo, *Steyermark 88188* (GH, NY, US, VEN). 22–25 km ESE of Santa Elena, *Steyermark et al. 112242* (MO). Headwaters of the Río Saca, *Wurdack & Guppy 99* (NY, VEN). CARABOBO: Near Bejuma, *Box 3940* (MO, VEN), *3943* (VEN). Maracay-Valencia, *Chase 12339* (US, VEN). Puerto Cabello, *Karsten s.n.* (GOET). DISTRITO FEDERAL: Sosa, *Badillo 18* (VEN), *38* (VEN). 19.8 km S of Carayaca, *Davidse 2902* (MO). GUÁRICO: 10 km S of San Juan de los Morros, *Davidse 3015* (MO). LARA: Aroa River, *Pittier 6384* (NY, US). MÉRIDA: Vic. of Tovar, *Pittier 12808* (VEN). MIRANDA: Los Teques, *Allart 211* (US). Sebastopal, *Badillo 115* (VEN). Entre Capaya y Curiepe, *Badillo 414* (VEN). Parque Nacional Guatopo, *Croat 21795* (MO). Cacarigua, *Curran 1* (VEN). Baruta–El Hatillo, *Gines 843* (VEN). Santa Lucia, *Killip & Tamayo 37030* (US, VEN). Silla de Caracas, *Morillo & Manara 1738* (MO, VEN). Valle de Siquire, *Pittier 5985* (NY, US, VEN). Vic. of Petare, *Pittier 9893* (GH, NY, US, VEN). Parque Nacional Guatopo, *Steyermark 90044* (NY, US, VEN). MONAGAS: Quiri Quiri to Caripito, *Chase 12580* (US, VEN). Cerro de la Cueva de Doña Anita, *Steyermark 88188* (GH, NY, US, VEN). PORTUGUESA: 20 km NE of Guanare, *Davidse 3149* (MO). SUCRE: Vic. of Cristóbal Colón, *Broadway 436* (GH, NY, US), *671* (US), *716* (GH, NY, US), *720* (GH, NY, US), *732* (GH, NY, US). Cerca Trapa, *Lasser & Lasser 3671* (VEN). TÁCHIRA: Between La Fria and Seboruco, *Breteler 4911* (VEN). TRUJILLO: Near Valera, *Pittier 10728* (GH, NY, US, VEN). YARACUY: Between San Felipe and Nirigua, *Aristeguieta & Panmier 1221* (VEN). Sierra de Aroa, *Aristeguieta & Panmier 1467* (VEN). Via Chivacoa, *Curran 53M* (VEN). San Felipe, *Curran 99* (VEN). Between Marin and Carbonero, *Pittier 11770* (NY, US, VEN). Entre Aroa y Altamira, *Steyermark & Bunting 105310* (MO). Guáguira, *Trujillo & Fernández 11* (MY). ZULIA: Cairo, *Lasser 2631* (VEN). Vegas del Río Santa Ana, *Pittier 10906* (GH, NY, US, VEN).

VIRGIN ISLANDS. ST. CROIX: Mt. Eagle, *Ricksecker 289* (F, MO, NY, US). Christiansted, *Rose et al. 3624* (US). ST. JOHN: *Morrow 17* (US). ST. THOMAS: Charlotte, *Millspaugh 520* (F, US). TORTOLA: Sage Mtn., *D'Arcy 537* (A), *538* (IJ). VIRGIN GORDA: *Fishlock 140* (US).

WINDWARD ISLANDS. BARBADOS: Welchman Hall Gully, *Proctor 25842* (IJ). Easy Hall Woods, *Proctor 26199* (IJ). DOMINICA: Sylvia Estate, *Cooper 26* (F, GH, NY, US), *26A* (NY, US). *Hitchcock 16415* (US). Morne Colla Anglais, *Hodge 1047* (GH, NY). South

Chiltern Estate, *Hodge & Hodge 1516* (GH). Providence Valley, *Hodge & Hodge 2069* (GH). Lisdara, *Hodge 2389* (GH, NY). Milton Estate, *Hodge & Hodge 2571* (GH), *2914* (GH). Castle Bruce, *Ramage s.n.* (GH). GRENADA: Richmond Hill, *Broadway 4674* (US). St. Georges, *Broadway s.n.* (NY). *Eggers 6224* (GOET, US); *Hitchcock 17675* (US). St. Patrick, *Proctor 17293* (A). MARTINIQUE: *Duss 770* (NY, US). St. Pierre, *Hahn 482* (P). *Hitchcock 16454* (US). Tiroli, *Stehlé 5436* (US), *5564* (US), *6028* (GH), *6150* (US). ST. LUCIA: Barre de l'Isle, *Cowan 1572* (A, NY, US). *Hitchcock 16494* (US); *Hunnewell 18975* (GH). Marigot Lagoon, *Smith 10199* (US). ST. VINCENT: St. George, *Proctor 25868* (IJ).

15b. **Lasiacis sorghoidea** (Devs.) Hitchc. & Chase var. **patentiflora** (Hitchc. & Chase) Davidse, Ann. Missouri Bot. Gard. 64: 375. 1978.

Lasiacis patentiflora Hitchc. & Chase, Contr. U.S. Natl. Herb. 18: 338. 1917. TYPE: Tobago, center of island, edge of woods on mountainside, 20 Dec. 1912, *Hitchcock 10268* (US-865566, holotype; US-975660, isotype).

Perennial; similar in most respects to *L. sorghoidea* var. *sorghoidea*, differs in the following respects; internodes glabrous; sheaths glabrous, the margin ciliate or glabrous, the auricular hairs 0.5–1.5 mm; collar usually puberulent, rarely glabrous; ligules 0.3–1.0(–1.7) mm long, ciliate with hairs to 1.0 mm; blades 6–18 cm long, 1.8–3.4(–4.5) cm wide, glabrous, sometimes slightly scabrous on the upper surface; panicles 4–22(–26) cm long, 2–10(–13) cm wide, the branches widely spreading, sometimes slightly reflexed, often rather open with flexuous, delicate pedicels, usually scabrous, the pulvini glabrous, occasionally puberulent; spikelets (2.8–)3.2–4.0(–4.2) mm long; first glume (1.3–)1.5–2.0 (–2.4) mm long; fertile floret 2.8–3.2 mm long, 1.7–1.9 mm wide, dark brown; caryopsis 1.7–1.8 mm long, 1.5–1.6 mm wide; chromosome number $n = 18$.

Ecology: This variety typically inhabits forest edges and brushy slopes at elevations from 200 to 2,000 m. Most specimens have been collected from November through February.

Distribution: This variety occurs in Venezuela, Colombia, Ecuador, and Paraguay in South America. In the West Indies, it is known from Hispaniola, Puerto Rico, and the following islands of the Lesser Antilles: Dominica, Grenada, and St. Vincent. In addition, it occurs on Tobago and Trinidad.

The plants from Tobago, Trinidad, and some from Venezuela are the most distinctive. They have glabrous leaves and spreading, open inflorescences with small spikelets borne on slender, delicate pedicels. Plants north and south of this center are closer to *L. sorghoidea* var. *sorghoidea*, differing only in their glabrous sheaths and blades, and the taxonomic distinction is correspondingly tenuous. The plants from these outlying areas have often been identified as *L. sloanei*. They resemble this species only in their glabrous leaves. The inflorescences never have the characteristic large, short-pedicelled, appressed spikelets of *L. sloanei*.

Localized in Venezuela are plants that have smaller leaves than is typical of *L. sorghoidea* var. *patentiflora*, and those plants closely resemble *L. divaricata* var. *austroamericana* and the glabrous small-spikelet form of *L. nigra*.

COLOMBIA. ANTIOQUIA: Vic. of Medellín, *Toro 377* (NY). CAQUETÁ: 15 km SW of Belen, *Davidse et al. 5692* (MO). HUILA: 32–33 km E of Neiva, *Fosberg 19777* (US). Inter Guadeloupe et La Resina, *Woronow & Juzepczuk 5744* (US). SANTANDER: Near Tapató,

Killip & Smith 20503 (GH, MO, NY, US). TOLIMA: Río Coello, *Killip 9732* (GH, NY, US). VALLE: La Cumbre, *Pennell 5402* (GH, US). VAUPÉS: San José de Guaviare, *Cuatrecasas 7464* (F, US).

DOMINICAN REPUBLIC. *Wright et al. 614* (US).

ECUADOR. GUAYAS: Teresita, *Hitchcock 20432* (US), *20524* (US). MORONA-SANTIAGO: Pachicutza, *Holm-Nielsen et al. 4543* (MO). PICHINCHA: 11 km W of Tandapi, *Gentry et al. 12110* (MO).

HAITI. NORD: Bayeux Morne Brigand, *Ekman 2624* (US). Massif du Nord, *Ekman 4330* (US). Vic. of Plaisance, *Leonard 9293* (US). SUD: Miragoâne, *Eyerdam 594* (F, GH, NY, US).

PARAGUAY. Pilcomayo River, *Rojas 292* (US).

PUERTO RICO. Vic. of San Juan, *Chase 6412* (US). Vic. of Mayagüez, *Chase 6824* (US).

TOBAGO. *Broadway 4841* (US). Pigeon Hill, *Cowan & Forster 1448* (NY, UC, US). Spey Side, *Hitchcock 10254* (US), *10255* (US), *10256* (US), *10257* (US). Center of island, *Hitchcock 10270* (US). Near Charlottesville, *Hunnewell 19912* (GH).

TRINIDAD. Port of Spain, *Hitchcock A.G.N.H.592* (F, GH, MO, NY, P, UC, US), *10034* (US), *10037* (ISC, US). Chacachacare, *Hitchcock 10062* (US). Port of Spain, *Hitchcock 10323* (US), *10324* (US). Manzanillo, *Hitchcock 10374* (US).

VENEZUELA. AMAZONAS: Río Negro, *Schultes & Lopéz s.n.* (US). ARAGUA: N of Maracay, *Box 3950* (VEN). 29 km S of Cua, *Steyermark 91783* (VEN). DISTRITO FEDERAL: Caracas Botanical Garden, *Berry 309* (MO). Between Caracas and La Guaira, *Fendler 1614* (MO). Caoma, *Jahn 303* (US, VEN). Near Naiguatá, *Steyermark 91813* (US, VEN). MÉRIDA: S of Mérida, *Chase 12385* (GH, NY, US, VEN). La Mucuy, *Lasser 540* (US, VEN). 2–4 km above Lagunillas, *Tillett & Hönig 738-337* (MO). MIRANDA: NE of Gran Felipe, *Aristeguieta & Panmier s.n.* (VEN). Near Sebastopal, *Badillo 113* (VEN), *313* (VEN). Parque Nacional Guatopo, *Steyermark 90036* (NY, US, VEN). Guarenas, *Williams 12402* (F, GH). MONAGAS: 14 km SW of Caripe, *Pursell et al. 9384* (NY, US). SW of Caripe, *Pursell et al. 9388* (NY, US). SUCRE: Vic. of San Cristóbal Colón, *Broadway 164* (GH, NY, US), *324* (GH, NY, US), *501* (GH, NY, US), *607* (GH, NY, US, VEN).

WINDWARD ISLANDS. BARBADOS: Turner Hale Wood, *Bovell & Freeman s.n.* (NY). DOMINICA: *Jones 49* (US). GRENADA: St. George, *Broadway 4446* (US). Richmond Hill, *Broadway 4674A* (P, RB, US). ST. VINCENT: Cannuoan Island, *Howard 11100* (GH). Bequia Island, *Howard 11276* (GH).

16. **Lasiacis standleyi** Hitchc., Proc. Biol. Soc. Wash. 40: 86. 1927. TYPE: Costa Rica, Guanacaste, La Tejona, north of Tilarán, moist forest, subscandent, 8 ft, 600–700 m, 25 Jan. 1926, *Standley & Valerio 45839* (US, holotype).

Lasiacis longiligula Swallen, Ann. Missouri Bot. Gard. 30: 232. 1943. TYPE: Panama, Canal Zone, forest along telephone cable trail between splice S16 and S49, Río Indio, trail toward Chico, 1 m tall, 12 Jan. 1935, *Steyermark & Allen 17435* (US, holotype; GH, UC, isotypes).

L. lucida Swallen, Ann. Missouri Bot. Gard. 30: 231. 1943. TYPE: Panama, Chiriquí, Volcán de Chiriquí, forest above Sabana de El Salto, on trail to Camp Aguacatal, 1500–1750 m, 10–13 Mar. 1911, *Maxon 5266* (US-675603, holotype; US-675607, US-186873, isotypes).

Perennial; culms creeping, rooting at the nodes, forming colonies, the distal ends erect to 1 m, or scrambling through shrubs up to several meters high; internodes 2–4 mm thick, herbaceous, hollow, often with striplike pith remains, puberulent toward the apex and with a line of puberulence, rarely pubescent with hairs to 1.5 mm long; nodes glabrous; sheaths puberulent, pubescent, or hispid with hairs to 3.0 mm long, occasionally glabrous, the upper margin sparsely to densely ciliate with hairs to 2.5 mm long, rarely both margins ciliate; collar glabrous or with a definite line of puberulence at its base; ligule a prominent, usually dark brown, lacerate membrane, (4.5–)5.0–7.0(–9.0) mm long, ciliate on at least one margin with hairs to 3.0 mm long, typically glabrous on the back; blades 10–18 cm long, (0.8–)1.2–2.9(–3.5) cm wide, broadly elliptic-lanceolate to linear-lanceolate, the upper surface usually strongly scabrous,

puberulent, or hispidulous, sometimes glabrous, the lower surface usually puberulent or hispidulous, sometimes glabrous, the apex acuminate, the base asymmetrical, the margins scabrid and often tending to be undulate; panicles rather compact, 7–27 cm long, the longest branch 2–15 cm, the branches usually ascending, occasionally widely spreading, producing secondary branches from near their bases and bearing spikelets almost throughout their length, or sometimes naked for ⅓ their length, scabrous, sometimes sparsely pubescent, the pulvini puberulent, the pedicels usually pubescent, occasionally scabrid; spikelets 3.7–4.5(–5.0) mm long; first glume 9–11-nerved; second glume 9–13-nerved, sterile floret without a flower, the lemma 11–13-nerved, the palea ⅓–¼ as long as the fertile floret; fertile floret 3.4–4.1 mm long, 2.2–2.5 mm wide, the anthers white, the stigmas purple; caryopsis 2.1–2.4 mm long, 1.7–2.0 mm wide; chromosome number $n = 18$.

Ecology: *Lasiacis standleyi* typically inhabits cloud or montane forests from 600 to 2,000 m. Although it does occur in undisturbed forest, it may be more frequent in clearings, along trails, and in thickets along road embankments in forested mountains. However, it is not a pioneer species and is more abundant in relatively stable secondary communities. It is rather uncommon. Flowering specimens have been collected from October to early April, although the majority of the collections have been made from December through March.

Distribution: *Lasiacis standleyi* is known in Central America from Chiapas to Panama, excluding El Salvador, and in South America from Colombia, Venezuela, and Ecuador.

This creeping species is distinguished by its hollow culms, moderately broad, short leaves, very long ligule, and rather compact inflorescences whose spikelets have short sterile paleas and no staminate flowers. It is effectively separated from all other creeping species except *L. grisebachii* by its hollow culms. From the latter species, it can be distinguished by its broad leaves and long ligules. *Lasiacis standleyi*, aside from its hollow culms, resembles *L. rhizophora* most closely. From this species, it can best be separated by its long ligules and the evenly distributed spikelets. Spikelets of *L. rhizophora*, on the other hand, are arranged in clusters toward the ends of the panicle branches. Hitchcock (1927a) mistakenly stated that *L. standleyi* and *L. rhizophora* have similar inflorescences.

Most of the South American specimens that I have identified as *L. standleyi* have previously been identified as other species. Many of these have been named *L. oaxacensis*. This species has solid culms, however. Other common misidentifications have been *L. ligulata* and *L. scabrior*, both erect woody species. *Lasiacis ligulata* can be easily distinguished from *L. standleyi* by its shorter ligule. *Lasiacis scabrior* is similar to *L. standleyi* in having large, prominent ligules, but it differs most prominently in its small panicles which are partially included in the upper sheath.

Few of the available South American specimens adequately show the basal parts of the plants. The culms of these plants may often become very vigorous and grow into large tangles. They, therefore, rarely show roots at the upper nodes. Unfortunately, only the upper parts of the plant are usually collected.

These specimens can often be recognized by their relatively wide, rather herbaceous, often collapsed culms, as well as by the other characters previously enumerated.

Lasiacis standleyi is a variable species, some forms of which have been named as separate species, *L. lucida* and *L. longiligula*, by Swallen (1943).

Lasiacis lucida was distinguished by Swallen (1943) from *L. standleyi* and *L. longiligula* primarily by its larger spikelets (5 mm vs. 4 mm). This single distinguishing character is quite inadequate. Only the type of *L. lucida* and one other collection (*Stern, Eyde & Ayensu 2032*) have such large spikelets. There are a number of specimens with intermediate spikelet sizes, but the majority are 3.8–4.2 mm long.

Lasiacis longiligula was distinguished from *L. standleyi* primarily on the basis of a larger ligule and panicle branches bearing spikelets in clusters at the ends of the branchlets (Swallen, 1943). The panicle branches of the holotype of *L. longiligula* are naked only two-sevenths their length or less, rather than one-third to one-half attributed to it in the description by Swallen. The whole panicle is rather densely flowered. Looser, less densely compact inflorescences do occur in this taxon. But there is no clear line of demarcation between the two types of panicles. The larger inflorescences nearly always have the lower parts of the inflorescence branches naked, but this is probably correlated with the amount of branching and vigor of the plant rather than distinct genetic differences. No discontinuities exist in ligule size, numerous specimens having ligule sizes ranging from 5–8 mm.

Abnormally long, pointed spikelets, somewhat reminiscent of some *Ichnanthus* spikelets, occur in *Skutch 4460* from Ecuador. These are mixed with normal spikelets (6.5 mm vs. 4.0 mm in length) on the F specimen. In each long spikelet there is a single insect larva, which presumably through hormonal stimulation causes the abnormal spikelet growth.

COLOMBIA. CALDAS: Río Santa Rita, *Killip & Hazen 10138* (US). CAUCA: Micay Valley, *Killip 7714* (GH, NY, US). Río Hondo, *Killip 8259* (GH, NY, US). Above Palmira, *Pittier 875* (US). PUTUMAYO: Below Sachamates, *Fosberg 20370* (US). VALLE: Hoya del Río Sanjuniquia, *Cuatrecasas 15602* (F, US). Palmira, *Killip 6149* (NY, US). El Silencio, *Killip & Garcia 33774* (COL, US).

COSTA RICA. ALAJUELA: San Ramón, *Brenes 13460* (F, NY), *20319* (NY). 3.5 km SE of Tapantí, *Lent 790* (F). Between La Hondura and La Palma, *Pohl & Davidse 11210* (ISC). Villa Quesada, *Smith P2512* (F, MO). CARTAGO: Vic. of Pejivalle, *Skutch 4571* (F, GH, MO, NY, US), *4649* (F, GH, MO, NY, US); *Standley & Valerio 47160* (US). El Muñeco, *Standley & Torres 50979* (US). GUANACASTE: Tilarán, *Acosta 9* (F). Volcán Rincón de la Vieja, *Pohl & Davidse 11675* (ISC, MO); *Pohl & Erickson 12665* (ISC). La Tejona, *Standley & Valerio 45820* (US). Near Tilarán, *Standley & Valerio 45532* (US). Quebrada Serena, *Standley & Valerio 46140* (US). Tilarán, *Valerio 1156* (F). Volcán Orosí, *Wilbur & Stone 10214* (MO). HEREDIA: Vara Blanca, *Skutch 3674* (MO, NY, US), *3680* (GH, MO, NY, US). Yerba Buena, *Standley & Valerio 50068* (US). PUNTARENAS: 1 mi SW of Cañas Gordas, *Croat 22279* (MO). Osa Peninsula, *Godfrey 66916* (NY, US). 4 km S of San Vito de Java, *Raven 20891* (F). Vic. of Buenos Aires, *Tonduz 3646* (US), *6540* (US). SAN JOSÉ: Vic. of El General, *Skutch 2206* (GH, MO, NY, US). Vara Blanca, *Skutch 3674* (US), *3680* (US). Vic. of El General, *Skutch 3802* (GH, MO, NY, US).

ECUADOR. NAPO: Vic. of Puyo, *Skutch 4460* (A, F, MO, NY, US). TUNGURAHUA: Valley of the Pastaza River, *Hitchcock 21894* (GH, NY, US).

GUATEMALA. SUCHITEPÉQUEZ: Finca Mocá, *Hunnewell 14627* (GH).

HONDURAS. ATLANTIDA: 3 km S of Lancetilla, *Molina 10467* (US). CORTES: N of Lake Yojoa, *Morton 7619* (NY). MORAZÁN: Vic. of El Zamorano, *Freytag 222* (MO), *306* (WIS).

MEXICO. CHIAPAS: 13 km N of Berriozábal, *Breedlove 31256* (DS, MO). Laguna Ocotal Grande, *Breedlove 32999* (DS, MO).

NICARAGUA. MATAGALPA: N of Santa Maria de Ostuma, *Williams et al. 24919* (F, NY), *27750* (F).

PANAMA. CANAL ZONE: Trail toward Chico, *Steyermark & Allen 17435* (UC). CHIRIQUÍ: Vic. of New Switzerland, *Allen 1338* (F, GH, MO, NY). 2.5 km N of Bambito, *Cochrane et al. 6296* (MO). 3 mi N of Volcán, *Croat 13559* (ISC). 1 mi E of Cañas Gordas, *Croat 22331* (ISC, MO). Above San Felix, *Croat 33047* (MO). Cerro Colorado, *Folsom et al. 4845* (MO). La Fortuna, *Hammel 2269* (MO). Volcán Chiriquí, *Hitchcock 8199* (in part) (UC, US). 2 mi above Boquete, *Killip 1529* (US). Vic. of Boquete, *Stern et al. 2032* (US). DARIÉN: Cerro Mali, *Gentry & Mori 13855* (MO). Cerro Tacarcuna, *Gentry & Mori 14090* (MO). Cerro Sapo, *Hammel 1134* (MO), *1310* (MO). HERRERA: Above Chepo de las Minas, *Folsom et al. 6996* (MO), *6970* (MO). LOS SANTOS: 25 mi SW of Tonosí, *Lewis et al. 2896* (COL, MO). PANAMÁ: Cerro Azul, *Croat 17298* (MO). Cerro Campana, *Croat 22784* (MO); *Dressler 3942* (MO). Cerro Azul, *Duke 9345* (MO). Cerro Campana, *Dwyer et al. 4728* (MO). Cerro Jefe, *Dwyer et al. 7239* (MO); *Dwyer & Gentry 9498* (MO); *Gentry et al. 3515* (MO). Cerro Campana, *Lewis et al. 3048* (COL, MO, UC). 3 mi NE of Altos de Pacora, *Liesner 527* (MO). Cerro Azul, *Nee 9295* (MO); *Porter et al. 4094* (MO). Cerro Campana, *Porter et al. 4272* (MO), *4882* (MO). La Eneida, *Soderstrom 2007* (ISC, MO). Cerro Campana, *Wilbur & Weaver 11300* (MO). VERAGUAS: NW of Santa Fé, *Mori & Kallunki 5315* (MO).

VENEZUELA. TRUJILLO: Entre Escuque and La Mesa de San Pedro, *Steyermark 104658* (VEN). ZULIA: Sierra de Perijá, *Steyermark et al. 105551* (MO). Río Apón, *Vareschi 3166* (VEN).

17. Excluded Species and Names of Uncertain Status

Lasiacis excavata (Henrard) Parodi, Notas Mus. La Plata, Bot. 8: 92. 1943.

Panicum excavatum Henrard, Repert, Spec. Nov. Regni Veg. 23: 179. 1926. TYPE: Paraguay, Guarapi, dans les forets, tiges radicantes, 1881, *Balansa 2947* (L, holotype).

Parodi (1943) transferred this species to *Lasiacis* on the basis of the small cratiform depression at the apex of the fertile lemma in which is borne a fine pubescence. There are no other spikelet characters in common with *Lasiacis*. The very narrow spikelets borne erect on the pedicels are quite different from anything found in *Lasiacis*. For this reason, I exclude this species from *Lasiacis*. As Parodi (1943) noted, the base of the fertile lemma does have a depression reminiscent of those in *Ichananthus*. The real affinity may lie with this genus or with the *Panicum* species closely related to *Ichnanthus*.

Panicum divaricatum L. var. *latifolium* Fourn., Mex. Pl. 2: 33. 1886, non *P. divaricatum* var. *latifolium* Schlecht. & Cham., 1831.

The ten specimens cited by Fournier under this variety represent a mixture of *L. ruscifolia* and *L. nigra*.

Panicum maculatum Aubl., Pl. Guian. 1. 51. 1775. *Lasiacis maculata* (Aubl.) Urb., Symb. Ant. 8: 751. 1921.

The application of this epithet is uncertain. The species cannot be identified from the description. Urban (1919) used the name in place of *L. sorghoidea* (Desv.) Hitchc. & Chase. He based this on an unpublished (Hitchcock, 1927b) drawing of Plumier which was cited as a synonym of *P. maculatum* by Aublet (1775). Urban noted that "Aus der Abbildung Plumiers kann man nicht ersehen, ob *Lasiacis sorghoidea* (Desv.) Hitchc. et Chase oder die sehr nahe verwandte *L. sloanei* (Griseb.) Hitchc. vorliegt." He further stated that Plumier probably

described a plant from Martinique, and since *L. sloanei* did not occur there, the name must apply to *L. sorghoidea.* However, Aublet's description almost certainly was based on a plant from the Guianas. Since *L. ligulata* is the most common species in this region, the name may actually refer to *L. ligulata.* Stafleu (1967) indicated that the main fragments of Aublet's herbarium are at BM and P. It has not been possible to locate a type yet in these two herbaria. Until this can be done, it seems wise to follow Hitchcock (1920) is assigning this name to doubtful status.

Panicum ruscifolium H. B. K. var. *amblyoides* Fourn., Mex. Pl. 34. 1886.

No specimens are cited but five specimens are cited under the two subvarieties of this variety.

Panicum ruscifolium H. B. K. var. *amblyoides* Fourn. subvar. *glabra* Fourn., Mex. Pl. 34. 1886, nom. nud.

Panicum ruscifolium H. B. K. var. *amblyoides* Fourn. subvar. *pilosa* Fourn. Mex. Pl. 34. 1886, nom. nud.

Panicum scariosum Trin. ex Steud., Nom. Bot., ed. 2. 2: 263. 1841. nom. nud.

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